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OF THE

BATH AND WEST AND SOUTHERN COUNTIES SOCIETY.

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"He that goes about to forward agricultural improvement must begin by finding out the true reason of what is called routine, or 'the custom of the country.' It sometimes happens that these reasons are only accidental, and then you may dismiss them fearlessly; but often it turns out that every-day practice rests on a solid foundation of facts; and then if you make an onslaught on local prejudices, they will be sure to beat you."

"The true course for the agricultural improver is, to take one step at a time, to gain a clear insight into facts by experience, not to try to go too fast, and to trust to the work of time."

"If practice which sets up to do without theory is contemptible, theory without practice is foolhardy and perfectly useless."—*From the Rural Economy of England, Scotland and Ireland*, by LEONCE DE LAVERGNE.

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BATH AND WEST AND SOUTHERN COUNTIES SOCIETY.

Original Articles and Reports.

I.—HOW TO IMPROVE AND INCREASE BRITISH LIVE STOCK.

By A. T. Matthews.

INTRODUCTORY.

During the last few years the welfare of the herds and flocks of the United Kingdom has been the subject of much discussion, not only by the agricultural world itself but also by many self-appointed teachers in the press, whose theories have not always commended themselves to practical men. For instance, we have often met with arguments in favour of laying down more land to permanent pasture, to enable it to carry a larger head of stock, while those who have adopted that policy in the past have found that it has had exactly the opposite effect.

But the most striking sign of the times has been the intervention of the Government with their schemes for improving the quality of what is called the "common stock of the country" by means of pedigree sires provided with the aid of public funds. Only a very few years ago any such idea would have been scouted as impossible, and the fact that such proposals have actually been put in practice is a clear proof that the nation has at last awakened to the immense importance of home production, at least of such articles as meat and milk. No government would have dared to devote the tax-payer's money to such a purpose unless convinced that such action would be backed by public opinion.

At first sight, then, it may seem superfluous and, indeed, almost an

impertinence, for an outsider to put forward his own views on a matter which is engaging the attention of Government Departments, who are actually at work on a great scheme of improvement. When we reflect, however, on the nature of that work, the novelty of the principle involved, and the necessary diversity of its objects and methods, we feel that there must be room for many minor suggestions as to the best means of obtaining the ends which we all have in view. Even criticism may be called for, and, when needed, should be fearlessly expressed by those who, by virtue of practical knowledge, are competent for the task, but for this we must wait till time reveals the weak spots in the Government plan.

The scheme as it now stands is confined to the laudable endeavour of improving the *quality* of our live stock, but this seems very far from covering the ground of the national requirements. For very good reasons, which we shall endeavour to explain, it is of greater importance that we should increase the number of our stock than that we should improve its quality. Time has brought great changes, and one of the most striking and unexpected in the last ten years, is the loss by this country of its virtual monopoly of the surplus meat supplies from the younger countries overseas. This has revolutionized the position of the home producer and threatens the British consumer with high prices for his meat for years to come. It remains to be seen whether British farmers will rise to the occasion, and not only breed better cattle, sheep and pigs, but as many of them as the land will fairly carry.

I have no great love for statistics as such, and only those will be quoted here which seem necessary in order to show at a glance what our position as to numbers now is in comparison with that of past years.

CATTLE.

In 1913 there were 11,936,600 head of cattle in Great Britain and Ireland, this showing an increase of over a quarter of a million in comparison with 1912, and being the highest point attained for at least thirty years. The lowest returns in that period were those of 1888, when the number stood at 10,268,554. The returns for England and Wales were less favourable last year than those for the whole of the United Kingdom, the total being 5,716,944, a decline of 124,000 from 1912, representing a fall of 0·74 per cent.; and 42,660 less than the average for ten years. It is, however, gratifying to find, from the preliminary statement of the Board of Agriculture, that, in 1914, this loss in England and Wales has been more than counterbalanced by an increase of 163,000, or 2·8 per cent., in the United

Kingdom. On the whole, therefore, there is not much to complain of as regards cattle, but it is evident that the chief credit belongs to Ireland, and that the increase of pasture land in England has had no beneficial effect on the cattle-rearing industry.

SHEEP.

It is when we come to deal with the alarming shrinkage in our flocks that every well-wisher to the agriculture of this country must feel the most concern, for it not only points to so much less capital being employed on the land, with a serious reduction of home-grown food, but also to the loss of the best fertilising agency for the land itself.

The total number of sheep in the British Islands in 1913 was 27,629,206, this being 1,338,289 less than in 1912, and the lowest since 1884. The maximum during the thirty years was reached in 1882, when the total number was 33,642,883, so that last year we were six millions below the highest record during that period.

It is important to differentiate here between the returns for the whole country and those for England and Wales only, for, in the latter portion of the country, we again find the defaulter. In 1913 the total number of sheep in England and Wales was 17,130,286 against 18,053,365 in 1912, a falling off of 923,079. The 1913 returns were 1,812,220 below the average of ten years or nearly 10 per cent.

The preliminary statement for 1914, just published at time of writing, but referring to England and Wales only, affords some ground for hope that the tide has turned, for it shows an increase of 327,000, or nearly 2 per cent. It would, however, take three years at that rate of progress to make up for the loss of nearly a million in 1913.

PIGS.

It is well-known to all experienced pig breeders and dealers that the numbers and the price of pigs fluctuate in a curious manner, and this goes far to rob the excess or deficiency in any one year of much of its importance. The pig breeds so rapidly that, when high prices prevail, owing to shortage, the lost ground is soon made up. The proof of this statement is found in the figures for 1913 and 1914 for, while last year's returns for the United Kingdom gave the total as 3,305,771, there has in one year been an increase of 677,000 or 20·06 per cent. The largest number in any year since 1884 was recorded in 1890, when the total for the United Kingdom was 4,362,127,

but only two years later we find the lowest in the same period with only 3,263,482, or a very sudden decrease of over a million.

The great loss last year was attributed by some people to the regulations enforced against swine fever, but, in the face of the foregoing figures, and the fact that swine fever has since been more prevalent, that theory must be abandoned.

THE GENERAL STATISTICAL POSITION.

Broadly speaking, then, it may be said that, as regards cattle, the country has rather more than held its position since the depression in agriculture set in about a generation ago, that, in the same period it has lost ground to a serious extent with its sheep, while pigs have so fluctuated from year to year that no particular importance attaches to the returns for any individual year.

CAUSES FOR FLUCTUATIONS AT WORK.

I have always maintained that the best possible index of the state of agriculture in this country is found in the number of its stock, and more particularly that of its sheep, and if that be a sound conclusion we may find the first cause for the depletion of our flocks in the loss of capital suffered by farmers over a considerable period. The decline of arable cultivation and the increase of pasture is a decided proof that the financial position of the farmer has weakened, for while he has produced much less corn, he has not materially added to his cattle and has reduced his sheep to an alarming extent. Dairying has had its attractions, one of which is the ready money it brings in at all seasons of the year, and it is to the sale of new milk that the maintenance of our cattle totals must be attributed. Every field that is laid down to grass means fewer sheep, but does not, necessarily, mean more cattle.

It must not be forgotten, however, that three years ago we were passing through a period of extraordinary cheapness, when choice small Down sheep were selling in Islington market at 7d. per ℔. This extreme depression did not last long, but it had an adverse effect on breeding and materially helped to bring about the present scarcity. The great drought of 1911 with the failure of the root crop caused many farmers to reduce their flocks from sheer scarcity of food. All these causes have contributed to the shrinkage but seem quite insufficient to account for the loss of six millions, which, in my view, is due more to the loss of capital than all other causes put together.

EFFECT OF SMALL HOLDINGS.

Not for one moment would I attempt any attack on the principle of providing small holdings, which in the hands of suitable men, do, I firmly believe, increase the sum total of the people's happiness and content, but, as a factor in this question of how to increase and improve the nation's live stock, the small holder is hopeless. It would be interesting to ascertain the percentage of those now existing who keep a cow. We think it would be a small one, while their stock of sheep would be a negligible quantity. Probably they would contribute a fair proportion to our totals of pigs and poultry, but if the movement extended very widely, most probably cattle, and certainly sheep, would decrease in proportion to the land so occupied.

THE DESIRABILITY OF A LARGE INCREASE.

It may be objected that, as the number of cattle in this country is admitted to be as large as it has ever been, there can be no necessity for any measures calculated to increase them greatly, and it may be urged that if farmers could be induced to add seriously to their present stock they would by so doing be placing more cattle on the land than nature intended it to carry, and that, at the same time, they would be overstocking their own market and thus reduce prices. Now there would be something to be said for this last argument if there were no other countries to be considered but our own; if there were no variations in the population in this and other consuming countries; no new competitors springing up for the surplus production of the young countries; and no possibility of the demand exceeding the supply. But, within the last few years, we have seen enormous changes in the meat trade world, and changes, too, of quite an unexpected character. In the last years of the old century the position of agriculture in Britain seemed hopeless. Meat importations increased year by year, and this country was, practically, the only market for the surplus of North and South America and our Australasian colonies. England was the "dumping ground" for the world, farmers were in despair and depression reigned supreme.

Let us now glance at some of the things that have happened since and have entirely changed the outlook. The most startling change of all is seen in the position of North America. We need not here quote any figures. One material well-known fact is enough. The great republic has become a buyer instead of a seller of meat, and is now competing with us for the produce of Argentina and Australia. Fifteen years ago no one ever dreamed of such a transformation as this, but it has come, and great is the anxiety behind the scenes

in the wholesale meat market. There have been indications, too, in the old world of a demand for a share of the meat coming from the southern hemisphere. There is no great trade at present, but no one doubts that there will be a steady increase.

The strongest possible proof that the world's demand for meat has been for several years overtaking the supply is furnished by an examination of the course of prices in this country since 1904. In that year the average price of fat cattle of prime quality, including the four principal breeds—Polled Scots, Shorthorns, Herefords and Devons—was about 6½d. per lb., and remained at that level during the next two years. Since 1906, however, there has been a steady upward movement, till in 1912 and 1913 the average value was 8d. for the same class of beef cattle. This represents an advance, in ten years of £4 10s. on a bullock of 90 stones, dead-weight, and the most significant feature in connection with this steady rise in prices is that it took place when the cattle of the country were increasing in number, for we find that between 1904 and 1913 there was a total increase of about 400,000 head.

Taking these two facts together—advancing prices and increasing numbers of home stocks—we are faced with the inevitable conclusion that there is plenty of room for an extensive expansion of the cattle industry in this country.

Another way of arriving at the same conclusion, and perhaps a shorter one, is to state that, while, in the three years 1900–3 the total supplies of beef, mutton, lamb, veal and pork gave 42½lbs. per head for the population of these islands, in the two years 1912–13 it was only 33 9-10th lbs.

It is the enormous growth of population and spending power of consuming countries with which we have chiefly to deal, while endeavouring to form an estimate of future possibilities, and, though these may be checked by the world war now raging, progress will be surely resumed, perhaps at a more rapid rate than ever, in the times of profound peace certain to follow the overthrow of militarism.

Against this expansion of demand there is no doubt that great efforts will be made in the coming years to establish new sources of supply, and these are easily to be found. They lie, waiting for development, in our colonies, in Brazil, and in the enormous fertile tracts of Russia. The British farmer should be urged to realise that it will take many years before production can possibly make up for the ground it has lost in the race against demand, and that he will be quite safe in using his best efforts to increase and improve his live stock.

POSSIBILITIES OF INCREASE.

Having endeavoured to show that a large increase of stock is desirable, let us now consider for a moment to what extent such a movement is practically possible. We have only to compare the present condition of our sheep stocks to what it has been in past years in order to see at once that, if an increase of our flocks is really desired it could easily be accomplished, but with regard to cattle the question assumes a rather different aspect, seeing that we have as many horned cattle in the country as at any former period. It does not appear to follow, however, that, because we have never had more, therefore the country is stocked to its full capacity, even under the present system of farming. In travelling widely through England, the impression is usually given to a practical farmer that the country, except in certain districts, is very sparsely stocked, and that, except in dry summers, the pastures are not half grazed. Moreover we compare unfavourably with several continental countries in the numbers per square mile that we maintain, which is perhaps the most decisive proof that we could do a great deal better than we have ever done yet, even with cattle. As for sheep we need not labour the point in view of the fact that we are some six millions short of our maximum attainment in the past.

HOW TO PROCEED.

Writing in a time of war, when agricultural questions occupy the attention of the country almost entirely from the standpoint of our supply of breadstuffs, arguments in favour of stock-farming as opposed to cereal production, seem, at first sight, to lose their weight. The times are altogether exceptional, and, very probably, we shall see a larger area of wheat sown in the autumn of 1914 and during next spring than has been the case for a quarter of a century. It is quite right that the country should choose the safe side, but, should the war suddenly collapse, there will follow a reduction of prices which will leave but a small margin of profit. On the other hand, a long war must inevitably involve high prices and full pockets for the farmers who grow wheat, which will mean, as it always has done, the power and inclination to purchase live stock. If large breadths of the wretched, newly formed pastures are ploughed up for wheat this season, it will be a benefit to the country at large, and to the farmers and labourers in particular while (though it may sound like a paradox) it will result in a larger head of stock being kept in the near future.

If our leaders of thought and opinion on rural affairs, as represented by our agricultural colleges on the one hand and the executive government departments on the other, become convinced of two facts, viz., that, in normal times, wheat will always come from over sea in such quantities that prices will be too low to tempt the British farmer to grow it extensively, and that, on the other hand, beef, milk, mutton and pork must be comparatively scarce, what should be their line of action? They must, by every possible means, instruct the farmers as to the direction in which their interest lies, and encourage them to follow it.

Farmers as a body are quick enough to follow the movements of their own markets, and most of them take an interest in the annual returns which give the numbers of cattle, sheep and pigs in the country. That, however, is the extent of the enquiry prosecuted by the large majority. Very few go so far as to enquire into the production and consumption of foreign countries and the colonial dominions, or study the problems relating to the growth of population and consequent demand. Their vision, though keen enough within its range, is bounded by a narrow horizon, and their judgment fails to embrace the world-wide influences which govern the course of trade in all its bearings. This being the case, a rise in values such as we have lately witnessed, instead of acting as a stimulant to increased breeding excites a sore temptation to sell, under the impression that the rise will be only temporary. Heifers which should be kept for breeding are fattened for the butcher, and ewe lambs and tegs are also disposed of in large numbers.

What the farmers of the United Kingdom should now realise is that there is an actual world's shortage of meat, and that it is likely to last for some years at least, while the chances of any prolonged scarcity of breadstuffs is more remote. In a word, we want to establish confidence in the future of stock farming as a first step in the movement for its encouragement. This may not be an easy task after the many years of cheapness, during which a new generation has sprung up which knows nothing of the decades of last century when present prices would have been considered quite normal, and so regards 5s. 6d. per stone for beef and 6s. 6d. for mutton as phenomenal figures. There are plenty of means for spreading the knowledge of the true state of the world's meat trade, but it should be done through more popular channels than the statistical reports of the Boards of Trade and Agriculture. The latter already issues a flood of useful literature in the form of leaflets on such things as insect pests and the gooseberry mildew, and a good one on "British Stock Farming of the Future" might have a

beneficial effect. Writers in local journals and speakers at public gatherings could do much, and Chambers of Agriculture, Farmers' Clubs, and Agricultural Societies might do still more.

PRACTICAL MEASURES.

Once convince the farmers that they need not hurry to realise their stock through fear of a great fall in prices, and that flocks and herds are the soundest of investments, and they would require little further inducement to wean more calves and increase the number of their breeding ewes. But there are other means which might be used to stimulate their efforts, and one of them might take the form of competitions. Our great societies (and small ones too, for that matter) might offer prizes for the largest number of lambs and calves per acre bred and kept on the farm to the age of one year, stipulating, of course, that they should be of a certain standard of quality. Landlords might use their influence and even stipulate in letting their land that a certain head of stock should be kept upon it, and every possible assistance and encouragement should be given to small holders to keep whatever live stock their holdings would profitably carry.

IMPROVEMENT IN QUALITY—THE PUBLIC GRANTS.

Having endeavoured to show that it is both desirable and practicable to increase the number of live stock we may now proceed to the question of quality, and note what is being done by the Development Commissioners as a start in the direction of improvement. It is a great thing that at last, after years of delay in the face of the good examples which have been set by other countries, the Government should recognise the desirability, if not the necessity, of doing something to stimulate the better breeding of live stock. The principle had been long conceded with regard to horse breeding, but what had been done in that direction was, confessedly, on behalf of the possible needs of the Government itself, and to extend that principle to animals kept for human food was a distinct step in advance. It is well, however, that the scope and general idea of the scheme adopted by the Commissioners should be fully understood, and its limits duly recognised. That those limits are quickly reached is shown by the following quotation from their last report :—" Complete agreement had not been reached concerning those parts of the scheme which related to the improvement of swine and cattle. The Commissioners have since recommended the grant to the Board of such sum not exceeding £14,800,

as may be required during 1913–14 for the bull and boar schemes, and an extract from the Commissioners' report to the Treasury giving the terms and conditions of this advance will be found in Appendix E to this report. There is one part of this extract to which they may draw special attention, viz., the passage where it is explained that grants (as distinct from loans) for the purchase of good bulls are to be given as a purely temporary measure. Earlier in this report they have stated their view that such grants should not be given as a permanent bounty to farmers, but only to such an extent and for such a period as will convince them by actual experience that it pays to give a good fee for the use of a high-class bull. It is solely on that basis that the Commissioners have agreed to even a temporary system of grants, whether to individuals or societies."

It is clear from the above quotation that the grants for bulls and boars are merely intended as object lessons, and will cease at an early date. The amount of the grants is not very imposing, and would not go very far, in themselves, towards effecting a general improvement in breeding. During the current year a sum of £13,650 was to be expended on bulls and £1,224 on boars, while out of the total grant for England and Wales of £41,750, no less than £8,400 is to be paid to Live Stock Officers, and £4,750 for other working expenses. The great "scheme" may indeed be productive of good, in an indirect manner, by sowing the seeds of knowledge amongst farmers who have hitherto failed to realise the advantage of using pedigree sires, but beyond that it does not pretend to go. It is quite time the widely entertained notion, that the Government contemplated a vast plan for improving the quality of British live stock by means of direct assistance, should be dispelled. The grants are offered for educative purposes and nothing more.

MILK RECORDING.

The grant of £4,736 for Milk Recording Societies is of very special interest and importance, and may prove to be money better spent than even the grants for sires. To improve the milk-yielding capacity of the country's dairy cattle the first step is to inculcate the necessity for methodical records of every cow's performance, for until these have been in use in a herd for a sufficient time to enable its owner to discriminate between the animals which are profitable or the reverse, his attempts at improvement will be, to a great extent, wasted effort, for careful selection and weeding out is almost as necessary to success as more skilful breeding. It is to be hoped

that these milk recording societies will make the results of their work as public as possible, and thus show every dairy farmer that in these days the only sure way to success is to work on business principles and to keep regular and correct accounts.

BEEF OR MILK.

In the foregoing Report the Commissioners say: "It is too early as yet to judge of the working of the scheme or its results, but they understand that it has been cordially welcomed and enthusiastically taken up throughout the country." There is plenty of room for errors of judgment, and we can imagine some of the difficulties that will crop up in the practical working of the scheme. It will be simple enough in those districts where the cattle are virtually all of one breed, and kept for a special purpose, whether it be for milk or beef, but in others it will be found no light task for the Live Stock Officer to decide on what strain of breeding a bull should be to best suit the needs of the locality. For instance. a Cruickshank Shorthorn bull of the most costly and fashionable strain of blood would be admirable for use by the grazier, but would work untold mischief in a dairy herd. In such cases he would probably end by choosing what is called a "General Purpose" bull, which would do but little good to either class of cattle. We must aim at producing the best, and the way to succeed will be to recognise that these are days of speciality in cattle breeding and to act accordingly.

THE PIG PROBLEM.

The question of quality with regard to pigs is one on which there is certain to be great diversity of opinion. Every distinct breed possesses its own enthusiastic supporters who will not listen to the claims of any other. Practical men, however, are beginning to see that what the country wants is a breed or cross that will meet the requirements of the market and the factor rather than those of the showyard, under the present arrangement of the prize-list. Considerable responsibility seems now to rest on the managers of shows with respect to this matter, for if this country is to hold its own in bacon production, we must try to supply the new factories, now being founded, with pigs that will compete with those from Denmark in possessing such a proportion of lean meat as is demanded by consumers. Could not our Show Societies assist here by offering prizes in special classes for "Factory Pigs," and appoint, as judges to act in that particular department, men from the factories themselves?

QUALITY IN SHEEP.

There is little to be said on the subject of the quality of British sheep or the possible means of improving it. There is, doubtless, room for a still nearer approach to perfection, even in our pure breeds, but, taken as a whole, the sheep of these islands are the admiration of the world, and what is needed is not so much finer quality as greater numbers. The word "quality" in this connection has more than one meaning, and it is open to question whether our breeders as a body sufficiently appreciate the sense in which the word is used by butchers. As a market term, it refers very largely to size and weight, and there is no disputing the fact that of late years the demand for small joints has greatly increased. The question, however, has many sides. We have a wonderful variety of breeds, everyone of which is specially adapted to the district in which it is chiefly found as regards soil, climate and altitude. Great skill and enterprise have been bestowed on each variety in the development of their several characteristics, and on this debateable question of size it may be presumed that our breeders are themselves the only judges of what will pay them best.

AN OBSTACLE TO IMPROVEMENT.

It is by this time generally admitted that, with cattle especially, the only sure way of improvement is by the use of pure-bred sires. so "impressive" in their powers that the great majority of their offspring will be stamped with their own characteristics, irrespective of those of the females with which they are mated. It is by no means an infallible rule that "like begets like," though the saying is so often quoted, otherwise any good animal without a pedigree would be equally effective with one of the highest lineage. A few years ago ordinary farmers treated pedigree with contempt, but all the more intelligent of the class are now fully convinced of its value and, under certain circumstances, will incur the extra outlay on a pedigree bull. But those circumstances do not arise with the dairy farmer who slaughters his calves as soon as they are dropped, or sells them to a dealer at a few days old. In fact, the only class of farmer who is willing to give a fair price for a pure-bred bull is one who rears as well as breeds. It is the present system which is so widely followed in this country of buying in cows for the dairy or lean bullocks for grazing that tells so heavily against improved breeding. If every dairy farmer and every grazier reared his own stock we should see a wonderful change for the better in British cattle, but that is an impossible proposition, and it only remains to consider whether anything can be done to encourage better breeding

by those who sell off their young stock for others to rear. It is not an easy question to answer, but it seems one very well worth the attention of the societies and even that of the Board of Agriculture.

It might have a good effect if purchasers of young stock would demand a certificate of their sire's pedigree, furnished by the breeder, and such a practice might gradually become general when it was seen that proof of good breeding added to their value in the market.

CONCLUSION.

The subject under discussion is complicated by various issues, and, however desirable it may be to make live stock the dominant feature of British farming, there are factors militating against progress in that direction which can not be ignored. One of these is the growing scarcity of labour, leading to the abandonment of the plough and the increase of inferior pasture. It must be conceded that, judging by statistics, this process, though not fostering any large increase in cattle, has not resulted in any reduction in their average numbers. But it is quite otherwise with sheep, which seem to diminish with the growth of pastoral farming, so that on the whole, it may be said that far more stock could be kept on plough land than on grass. If then it can be shown that well-farmed arable land will produce more food for stock—in addition to the corn grown upon it—than any but the richest pasture, it is obvious that every acre laid down to pasture is a loss to the country, and the tendency to abandon arable cultivation should be checked in every possible way.

We have tried to show that what our farmers want at the present time is more confidence in the future of the trade for meat, and this should be instilled into them by a systematic propaganda on the part of those able to conduct it.

A very significant special Act has just passed both Houses, giving the Board of Agriculture power to interfere if it should be found that, owing to the war, high prices tempt farmers to slaughter their stock to such an extent as to seriously reduce their breeding stock. This may be regarded as establishing a new precedent, and should make it possible to deal with a firm hand with the terrible waste always going on by the slaughter of calves as soon as they are dropped, and even with the slaughter of ewe lambs. It is to be hoped that the Board will be allowed to retain their new powers and not fear to use them in case of necessity, though before resorting to compulsion they should neglect no means of showing that stock rearing is the surest road to success in agriculture, and best conduces to the national welfare.

II.—INSECTS THAT HELP US.

By Harold Bastin (Author of "Insects, their Life-Histories and Habits," etc.).

Indirect Benefits.

Some years ago the round of the press was made by a paragraph which solemnly stated that the complete extinction of all insects—the hive-bee alone excepted—could result only in benefit to mankind. This remarkable pronouncement was supposed to emanate from "a well-known authority," but we may safely disregard this time-honoured journalistic tag, since, on the face of it, the whole idea is ridiculous. Artificial silk, although admittedly a triumph of inventive genius, is still far from ousting the natural product of the silkworm—as witness the growth and expansion in recent years of the industry concerned. We may frankly admit, however, that, when wax and silk have been mentioned, the direct benefits derived by mankind from insects are few, and of minor importance. But insects help us chiefly in indirect ways. The usefulness of bees in promoting the fruitfulness of many kinds of plants was dealt with at some length by the present writer in the last issue of the "Journal." There are, moreover, other flower-frequenting insects, too numerous to mention, all of which bear their part in the same beneficent scheme. Yet this phase of insect activity seems relatively insignificant when we contrast it with the vast labours of these tiny creatures as scavengers in all parts of the world. In this work many insects that are commonly regarded as an unmitigated nuisance are honourably concerned. In the tropics, for example, the depredations of termites (or "white ants" as they are often called) frequently cause serious loss and inconvenience; yet these same insects, assisted by other wood-feeding species, rapidly reduce the trunks and branches of dead trees to pulp or powder, which serves to replenish the soil. Nor is this process of natural manuring the only end gained. So great is the access of growth over dissolution among tropical vegetation that, but for the intervention of insects, the forests would gradually become blocked up with dead timber, and be thus destroyed.

How Insects Assist Bacteria.

We cannot doubt that insects render a like service even in temperate regions, for wood and vegetable fibres offer a stubborn resistance to the ordinary processes of decay. Men of science tell us that the chemical agents of decay and putrescence are the

excessively minute forms of life called "bacteria." So far as can be ascertained, the absence of bacteria would involve the complete cessation of decomposition, so that lifeless organic substances—notably the dead bodies of plants and animals—would remain indefinitely unchanged upon the face of the earth. Presumably this would lead ultimately to the complete disappearance of life, since all the available matter for its manifestation must sooner or later be used up and locked up irrecoverably. Thanks to the ubiquity of certain bacteria, and to their almost inconceivably rapid increase under favourable circumstances, a catastrophe such as we have just imagined is impossible. Yet we may question whether the bacteria, alone and unaided, could cope with the enormous masses of effete matter which the dead tissues of plants represent; and it is in this relation that the nibbling millions of the insect world probably perform their greatest service—not merely, be it noted, by reducing dead vegetation to a state in which it can be dealt with satisfactorily by bacteria, but also by checking a too luxuriant leafage during the period of growth.

This line of argument is pithily set forth in a most interesting little book* by Mr. R. B. Henderson, of Rugby School. He suggests that if we were entirely freed from the attacks of insects, "too many leaves would be left to die in the ordinary course of events, and too many bacteria would be called into being to remove so much dead vegetable matter. Too many bacteria might result in great havoc being wrought in the animal kingdom, with ultimate results no less disastrous to the vegetable world itself; for it is a remarkable fact, never to be forgotten in dealing with terrestrial life as a whole, that animals are quite as necessary to the existence of plants as plants are to animals. This is brought about as follows: Plants get their supply of carbon (of which they are largely made) out of the carbon dioxide of the air. Now there is not an inexhaustible supply of this gas, and plants would soon have come to an end of it were it not that the entire air-breathing animal kingdom continually renews it by taking in oxygen and giving out carbon dioxide, which is just the reverse of the process carried on by plants in sunlight. So each kingdom is necessary for the other."

"THE BALANCE OF NATURE."

We seem forced to admit, therefore, that even caterpillars and other leaf-eating insects "have their uses," unwilling as the farmer

* "The Scaly-Winged: A book on Butterflies and Moths for Beginners." By R. B. Henderson, M.A., Christophers, Lancaster Gate, W.C.

and the gardener may be to concede the point. The fact is that the whole animate world may be likened to a huge machine which is delicately adjusted to perform a special kind of work in a definite way. If any part should fail to act, as the result either of internal injury or of a check in the flow of raw materials, the hurt must be speedily stayed, or it will surely spread until, in the end, the whole machine will be at a standstill. This, doubtless, is the guiding principle which underlies all those ceaseless adjustments and re-adjustments that serve to maintain what we speak of as "the balance of nature"; and in a general way we are ready enough to admit its rectitude. But when particular cases are concerned, our mental attitude is mainly influenced by the manner in which our immediate interests are affected. If, for example, we have been victimised by a plague of voles, we welcome the birds-of-prey which flock to our district as if they were emissaries direct from Providence. But if we have planted wide areas with mangolds, or carrots, or onions, we find cause for wonder and resentment when we are deprived by insect invasion of the full results for which we hoped. Yet in each instance the delicate balance of power has been threatened, and Nature has merely taken her usual measures to ward off the assault.

"BUG VERSUS BUG."

The logical conclusion, foreshadowed by considerations such as those which have been briefly set forth above, is that there are no such things as "pests," since all things are working together for good in the best of all possible worlds. This may be sound philosophy, but it would prove a disastrous policy if put into practice by the agriculturist. Circumstances force him to adopt a frankly materialistic attitude, and to rivet his gaze upon his own parcel of land—leaving the great world's farm to take care of itself. For when primitive man first tilled the soil and sowed seeds therein, he openly rebelled against Nature's old-established rule, and he has had to fight hard ever since to maintain and extend his dominion. But in this fight he has not been without allies. The same balancing principle that causes devastating pests to multiply can call other hosts into being which sweep the pests before them. These are the parasites and insects of prey which feed upon and destroy the plant-feeding species. Many remarkable instances of the power of one insect to check the increase of another might be cited, especially from the records of the United States, where the whole question has been very closely studied and the policy of "bug

versus bug" adopted in a whole-hearted manner, both by the Department of Agriculture of the supreme Government, and by the Legislatures of many individual States. The classical case in point is that of the scale insect known as *Icerya purchasi*, whose ravages in the Californian orange groves were checked by the introduction of a certain ladybird (*Vedalia cardinalis*). The pest was believed to have been imported with young lemon trees from Australia, whence also the stock of ladybirds was obtained—an expert, Mr. A. Koebele, being sent out by the Government for the purpose of collecting the insects. This was the first practical experiment of its kind. It proved so successful that the authorities concerned were encouraged to embark upon an extensive system of collecting, breeding and distributing beneficial insects as a means of assisting agriculturists in their fight against pests.

BENEFICIAL INSECTS.

In our own country comparatively little attention has been paid—officially, that is to say—to the subject of beneficial insects, although certain of the leaflets issued by the Board of Agriculture and Fisheries mention, as a kind of postscript, some of the "natural enemies" of the pest that is under consideration. Many of our authorities, however, appear to hold the view that artificial remedial measures are more rapid and certain in their effects—at least where the relatively small (and therefore easily controlled) cultivated areas of the British Islands are concerned. A few even question the importance of insect aid in any circumstances, urging that modern husbandry is altogether too highly organised—too far removed from Nature and her ways— to hope to gain appreciable assistance from purely natural sources. Against this, as we have seen, must be set the weight of American expert opinion, which is practically unanimous. Moreover, the average man of common sense (while, perhaps, declining to take sides in a controversy which promises to be long-continued) can scarcely fail to admit that the agriculturist will be well advised to have at his disposal such knowledge as will enable him to distinguish insect friends from insect foes, and so to arrange matters that the friends shall not be deprived of opportunity to accomplish the maximum good of which they may be capable. In other words, a little knowledge of entomology, if it assists the farmer or gardener to make a rough and ready classification of the insects that come under his notice in the course of the year, can scarcely fail to prove a very useful accomplishment.

CARNIVOROUS GROUND BEETLES.

Broadly speaking, beneficial insects may be separated into two great groups, viz., the insects of prey and the parasites; and each of these groups is capable of subdivision in accordance with the partiality or impartiality of its members—that is to say, some species in both groups restrict themselves quite rigidly to a particular kind of prey or victim, while others attack almost any insect of convenient size that they chance to encounter. We may take first the impartial insects of prey, of which probably the most important are the carnivorous ground beetles which constitute the large family called *Carabidæ*. It is true that several members of this family are known to be destructive to vegetation—the corn ground-beetle (*Zabrus gibbus*) being, perhaps, the most familiar of the culprits. But one is inclined to hazard the guess that this taste for vegetable fare has been recently acquired, since the vast majority of the *Carabidæ* are exclusively carnivorous, both in the larval and perfect states, and are unquestionably of great service to man in keeping injurious insects in check. As they are rarely active in daylight, they are seldom seen, unless one chances to turn over a clod or a stone, when several individuals are likely to be found hiding beneath. The common violet ground-beetle (*Carabus violaceus*—Fig. 1) is a fairly good type of the family, although most of the species are much smaller. The larvæ (Fig. 3), which live chiefly in the soil, are usually elongate in form. They have a hard head, but the rest of the body (except the first segment) is relatively soft. The six legs vary in length according to the species, but they are always well developed, and each tarsus (or foot) terminates in a pair of claws—a character which provides a ready means of discrimination, seeing that all other beetle larvæ have only *one* claw to each foot. Gardeners often destroy many of the Carabid larvæ along with wireworms and harmful grubs, such as "leather-jackets," whereas their presence in the soil is really to be desired.

"COCK-TAIL BEETLES."

Some of the larger "cock-tail" beetles, of which the so-called "devil's coach-horse" (*Ocypus olens*—Fig. 2) is probably the best known example, must also be helpful to man, as they are predaceous and very ravenous. Curtis, in his "Farm Insects," cites the "coach-horse" as a notable foe of the earwig because "on confining one under a tumbler with some of those insects, the beetle despatched and ate four of them in the space of an hour and a half." It is more than probable, however, that propinquity really decided the earwigs'

fate; for anyone who cares to make the experiment may prove that a famished *Ocypus* will eat almost any kind of flesh food that it can get. The larvæ, which resemble those of the *Carabidæ*, but may be known by the one-clawed feet, are quite as rapacious as their parents, and will readily devour each other when nothing else offers.

DRAGON-FLIES AND ROBBER-FLIES.

The system of wholesale destruction carried on in the soil by the above-cited beetles and their larvæ is delegated, in the air, to certain insects capable of exceptionally rapid flight. Among these the dragon-flies rank supreme. Their larvæ are aquatic, and thus do not count where the agriculturist is concerned; but the adults must destroy enormous numbers of injurious insects each season. This remark applies more especially to the large species of the genus *Æschna,* commonly called "horse-stingers," which, thanks to their powerful flight, are able to range over fields and gardens—far from the pool wherein the early stages of their metamorphosis were passed. There are also the alert robber-flies (*Asilidæ*), which have been called "inhuman murderers" by the American writer, Dr. Fitch, because of their ruthless rapacity. The larvæ are found burrowing in damp earth, and are believed to feed chiefly on beetle-grubs. Unlike many other flies which need little or no food when once they have reached the adult state, robber-flies are insatiably voracious when they attain their winged majority. A single individual has been observed to capture and kill eight moths in twenty minutes, while it is a fact that a member of this family is rarely seen without another insect held firmly in its grasp. When we realise that these "inhuman murderers" patrol every district of the countryside during the warm weather, we can form some idea of the prodigious slaughter for which they are responsible, and of the corresponding benefit that must accrue to the farmer and the gardener. The species known popularly as the "hornet-fly" (*Asilius crabroniformis*—Fig. 13-1) is our largest and handsomest—being so coloured that it might be mistaken, at first glance, for a hornet or a large wasp. It is by no means so common, however, as certain smaller and less attractive forms.

SCORPION-FLIES AND SNAKE-FLIES.

Two small families of insects with four, net-veined wings now claim attention. These are the scorpion-flies (*Panorpidæ*—Fig. 4) and the snake-flies (*Raphidiidæ*—Fig. 5). The former get their popular name from a curious appendage, not unlike the sting of a scorpion, which

terminates the body of the male—but not the female. They have prettily mottled wings, and quaint, horse-like heads, and are very numerous during the summer months, especially in woodland districts. The caterpillar-like larvæ burrow just below the soil, and feed on dead animal matter; but the adults capture living insects. The snake-flies, of which there are some five British species, also frequent wooded districts, but are less often seen—possibly because their habits are more retiring. They are black insects with transparent wings, and may be easily recognised by the curious elongation of the head and prothorax, which is suggestive of a snake, and is responsible for the popular name. The active, six-legged larvæ are found under bark, where, with the utmost voracity, they hunt their prey—small insects that frequent similar situations. In the United States, these larvæ were found to be especially destructive to the caterpillars of the codlin moth, which were attacked after they had spun their cocoons under the loose bark of the apple trees; and some years ago living snake-fly larvæ were sent from California to Australia and New Zealand (where the codlin moth is a great pest) in the hope that they might become acclimatised and benefit the fruit industry. Unfortunately, the experiment was not successful.

PLANT-BUGS AND GRASSHOPPERS.

Besides the impartial insects of prey that have been briefly described above, there are others which—while they are, perhaps, less obvious to the casual observer—must certainly make their presence felt. For instance, a considerable number of the plant-bugs (members of the sub-order Heteroptera) do not suck the sap of the various plants upon which they are found, but the juices of other insects. The need for careful discrimination is obvious, since many Heteroptera are exclusively vegetarian in their habits; but, as Miss Ormerod pointed out long ago, they "are rarely injurious in this country to any serious extent." This is so far true that the presence of numerous plant-bugs among our crops may safely be disregarded—if, indeed, it be not cause for actual congratulation. Two typical plant-bugs, both known to be insectivorous, are shown. The smaller is one of the *Capsidæ* (Fig. 9)—a family which comprises some 170 British species, many of which are very common in gardens. The larger (Fig. 10) is a "shield-bug" (so called from its shape) which abounds upon trees and bushes in the autumn, where it preys chiefly on caterpillars, whose juices it sucks. Another type of insect found in similar situations, and among vegetation generally,

is the long-horned grasshopper, of which we have nine indigenous species. These must not be confused with the short-horned, meadow grasshoppers, which are plant-feeders. The long-horns, on the contrary are largely carnivorous, and destroy many caterpillars and other insects—though they also eat leaves to some extent. Probably the commonest species is the brown "bush cheep" (*Thamnotrizon cinereus*). It may often be heard chirping in the hedgerows on summer evenings, but is perhaps less often seen than certain of its more attractive, green relatives.

The partial insects of prey—those which specialise, as it were, in the choice of their victims—fall naturally into four main groups, viz., the lacewings, the hover-flies, the ladybirds, and the solitary wasps. Of these the three former are concerned mainly with aphides or "greenfly," although scale insects and other small pests are also attacked to some extent.

LACEWINGS.

Science recognises two families of lacewings; but the most important, from the standpoint of the agriculturist, is that termed *Chrysopidæ* (Fig. 6), which includes fifteen British members. These are very delicate and beautiful insects, being pale green or greenish-yellow in colour, with wonderful lace-like wings and rather prominent eyes that in life have a peculiar metallic lustre. Indeed, lacewings are not infrequently called "golden-eyes," and sometimes "stink-flies"—a name which has reference to the unpleasant odour which these insects, if handled, leave upon the fingers. Altogether the Chrysopid lacewings are scarcely likely to escape notice, albeit they usually fly in the dusk, and unless disturbed, rarely leave their hiding places among foliage while the sun is high. Their life-cycle, moreover, has several points of unusual interest. The eggs, which are laid either singly (Fig. 7) or in little groups (Fig. 8) on the leaves and stems of plants, are quite unique—each egg being supported at the extremity of a long, slender stalk.* The larva, on hatching, climbs down this stalk and forthwith begins its hunt for aphides, of which it subsequently destroys large numbers. Its manner of feeding is peculiar, the victim being held high in the air until its carcass is sucked dry, when the empty skin is either thrown aside, or (in the case of certain species) used with others to cover the lacewing's larva's back. The larvæ of some species employ

* These eggs are often mistaken for a minute kind of fungus, or mould, by the uninitiated.

fragments of moss or lichen for the same purpose—the object apparently being concealment from possible enemies, although in this connection it is noteworthy that the habit is not universal, many of the larvæ going unclothed. When full-fed, each larva spins a small, round cocoon, wherein pupation takes place, and whence the perfect insect emerges in due course through a small round hole, to which the cover remains attached like a lid. Whether the adult lacewings feed at all, the present writer is unable to state; but their larvæ are very voracious, and must destroy myriads of aphides in every part of the country each season.

HOVER-FLIES.

The hover-flies (Fig. 13-2) form a section of the very large family *Syrphidæ*, the members of which vary greatly both in appearance and habits. It should be noted that these insects (as well as the robber-flies mentioned above) are true "flies"—that is to say, they belong to the order of two-winged insects, or Diptera, in which the hind pair of wings is represented by two tiny stalked knobs which are often called "balancers." Hover-flies are usually attractively coloured, often in a manner suggestive of a stinging insect, such as a wasp. As their name implies, they frequently hover, apparently almost motionless, at one point in the air, and then dart rapidly away—often, however, to return again to their original position. They abound in all rural districts, and even in town gardens, throughout the summer, dividing their time between flowers of various kinds and aphid-infested plants. From the former they pilfer pollen, which is their staple food, and doubtless render some incidental service as cross-fertilising agents. To the latter they resort in order to lay their eggs. The larvæ are not unlike small leeches, and lack the adaptive characters (*e.g.*, serviceable legs, well-developed sense organs, a hardened cuticle) that we usually find in insects that hunt in the open. On the contrary, they are typical maggots, without distinct heads, jaws, eyes, feet or antennæ. They are, however, remarkably muscular, and move about fairly quickly, from time to time rearing themselves up until they stand almost "on their tails"—the tapering, anterior part of the body being then lashed vigorously about in all directions in search of prey. The mouth is furnished with a pair of hooks by means of which the victim is seized and held. Curiously enough, the hover-fly maggot adopts much the same method of feeding as the larva of the lacewing, for it tears an aphid from its hold on the plant stem, hoists it aloft, and in this position rapidly empties its body of fluids. When the operation is complete, the empty skin is discarded, and the maggot

at once turns its attention to another member of the aphid flock that feeds, all unconcerned, hard by. When full-grown, the hover-fly larva fixes itself to a leaf or stem by the tail-end. Its skin then hardens and assumes an oval shape. Within, the pupa is formed in due course; and when the perfect fly is ready to emerge, it pushes out the front end of the old larval skin—the puparium, to give it its technical name.

LADYBIRDS.

Probably the most efficient—because of their numbers—of the aphid-destroying insects are the well-known ladybirds. There are numerous species, but the two commonest are the "two-spot" (*Coccinella bipunctata*), and the "seven-spot" (*C. septem-punctata*). Thsee occur almost everywhere, and are often extremely abundant. Several years ago, the writer examined a field of cabbages literally swarming with the "seven-spot" species. The insects were issuing from the pupa state, many of them being still soft and im-perfectly coloured. The crop showed signs of recent infestation by aphides, but scarcely an aphid remained: they had doubtless been exterminated by the ladybird larvæ. Ladybirds lay their elongate, yellow eggs in clusters, usually on the underside of leaves, where also the larvæ—and, of course, the aphides—are mostly found. The larvæ, though they differ somewhat in appearance according to their age, and the species to which they belong, are all very much like the example shown in Fig. 12. They are fairly well known to country people, who usually refer to them as "niggers"—a name which has reference to their dark, sooty aspect. Although ladybirds and their larvæ feed chiefly on aphides, this is probably because these pests are generally the most abundant food available. Some of the species certainly do good work in clearing off scale insects and red spiders, while observation goes to prove that a "nigger" is ready and willing to snap up any small insect that comes its way.

SOLITARY WASPS AND "FOSSORS."

We now come to the solitary wasps. These must not be confounded with the wasps that are often so numerous and trouble-some at the close of the summer; of them we shall have occasion to speak hereafter. Solitary wasps, as their name suggests, do not form co-operative communities, but each female, after pairing, constructs her own small nest, or nests, and makes provision for her offspring without the assistance of a special "worker" caste. There are sixteen British species included in the sub-family *Eumeninæ*

—all small, black insects striped and marked with yellow. One of them (*Eumenes coarctata*) is shown (Fig. 11), together with the quaint little earthen nest that it builds upon a twig of heather or some other plant. (Fig. 14). This species, however, is not nearly so common as some of the others, from all of which, moreover, it is sharply distinguished by its rêmarkably long "waist." Furthermore, the remaining fifteen species (all belonging to the genus *Odynerus*) do not fix their nest-cells to the stems of plants, but construct them in crevices of masonry, in burrows in the soil, or in other convenient cavities.

The food laid up by our Eumenine wasps consists of tiny caterpillars which they first paralyse by stinging. A considerable number of these half-dead victims are sealed up in each cell, together with a single egg; thus, when the latter hatches, the young larva finds itself surrounded by an abundance of food, which it steadily consumes. In Leaflet No. 2 (the revision of January, 1902) issued by the Board of Agriculture and Fisheries, one reads that *Odynerus parietinus* "has frequently been observed carrying off the smaller of these weevils (*i.e.*, the clay-coloured, or raspberry, weevil), and another hymenopteron (*Cerceris arenaria*) often does the same." In so far as it refers to *Odynerus*, this statement seems open to serious doubt—if only on the ground that a raspberry weevil would probably prove far too bulky a prey for any British member of the genus to cope with. With the *Cerceris* the case is different. Not only is it a larger and more powerful insect, but it belongs to a group of species which make weevils the special object of their hunting excursions.

This brings us to another family of solitary wasps, the *Sphegidæ*, with upwards of ninety British species, of which *Cerceris arenaria* is one. These insects are often referred to collectively as "fossors" or "diggers" because most of them excavate burrows in the soil, though some drive tunnels in decayed wood, or in the stems of bramble and other plants. The far end of the burrow is stored with some kind of animal food for the benefit of the grubs. Frequently caterpillars are used; but the provision may consist of beetles, aphides, two-winged flies, or other insects. In the allied family *Pompilidæ* the species hunt spiders, apparently without exception. Usually each species of digger-wasps selects one particular kind of prey, or at most several closely related kinds, and the victims are invariably paralysed by skilful stinging before they are conveyed to the burrow. Sphegid wasps vary a good deal in appearance. The *Cerceris* referred to above is black and yellow in colouration, and would probably pass as a "wasp" even with the uninitiated.

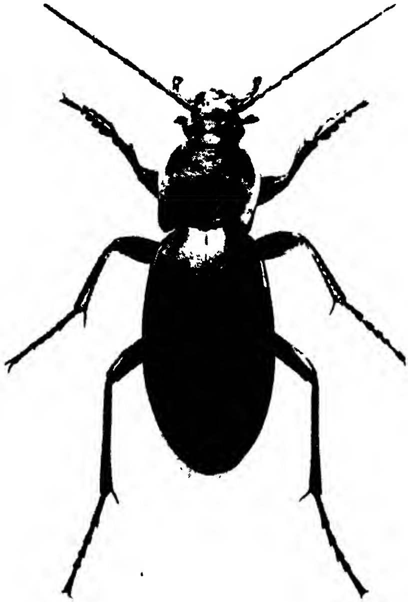


Fig. 1.—Common Violet Ground Beetle (*Carabus violaceus*).

Fig. 2.—Devil's Coach-horse (*Ocypus olens*).

Fig. 3.—Typical Larvæ of Ground Beetles.

A

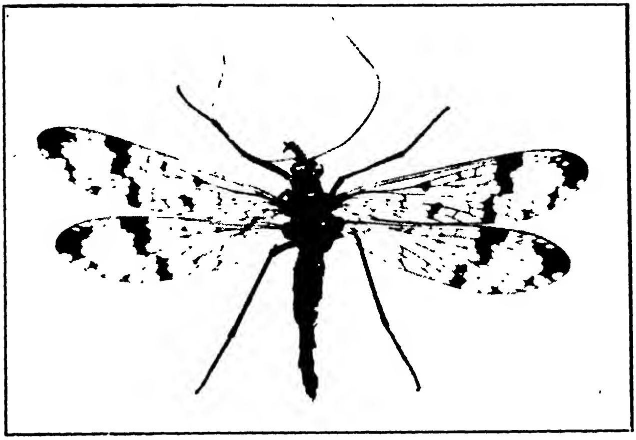


Fig. 4.—A Scorpion Fly
(*Panorpa communis*).

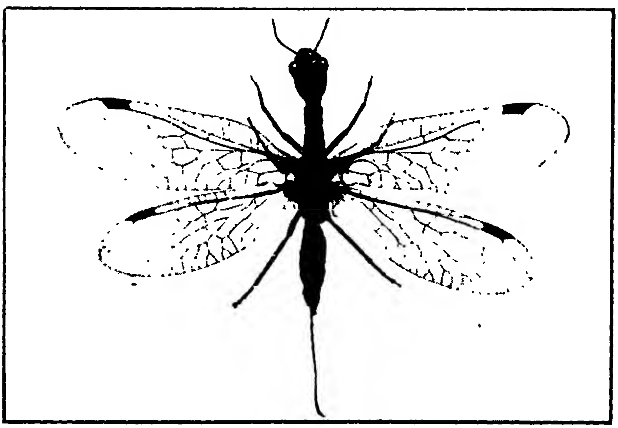


Fig. 5.—A Snake Fly
(*Raphidia sp*).

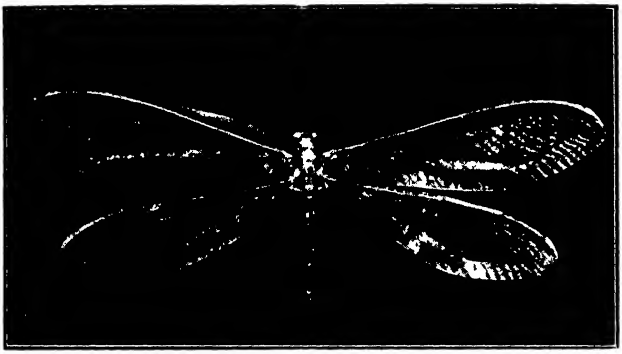


Fig. 6. A Lacewing
(Chrysopa perla).

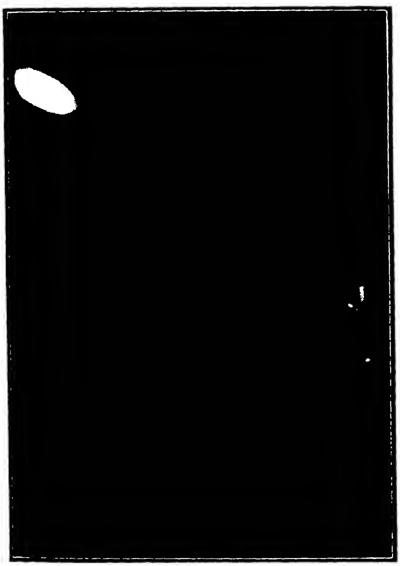


Fig. 7. Egg of a Lacewing
(Enormously magnified).

Fig. 8. Eggs of a Lacewing
(Enormously magnified).

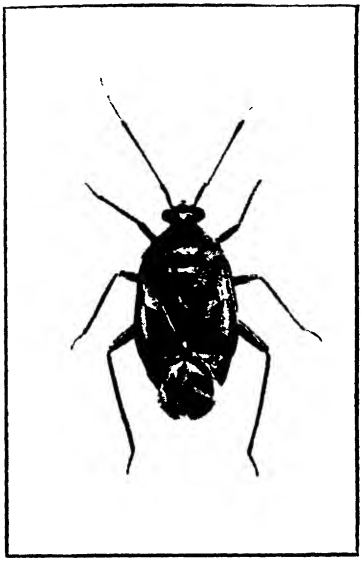


Fig. 9.— A Plant-Bug
(*Capsus laniarius*).

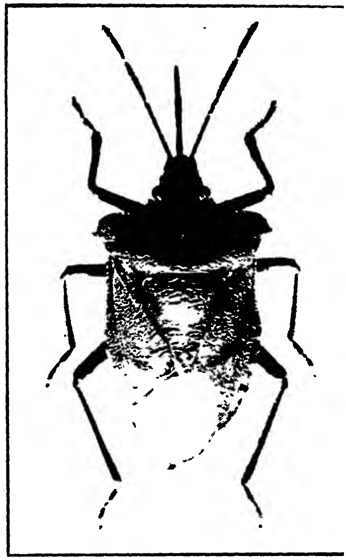


Fig. 10. A Shield-Bug
(*Tropicoris rufipes*).

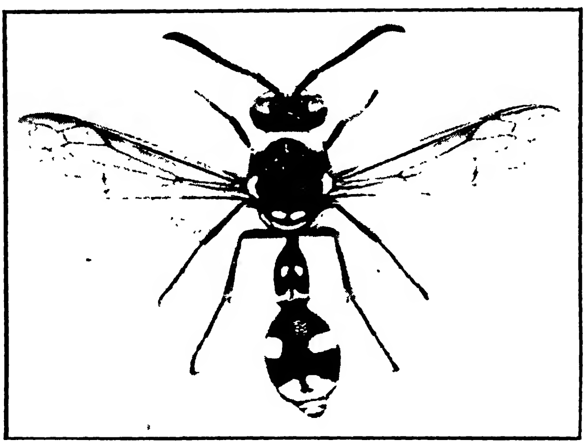
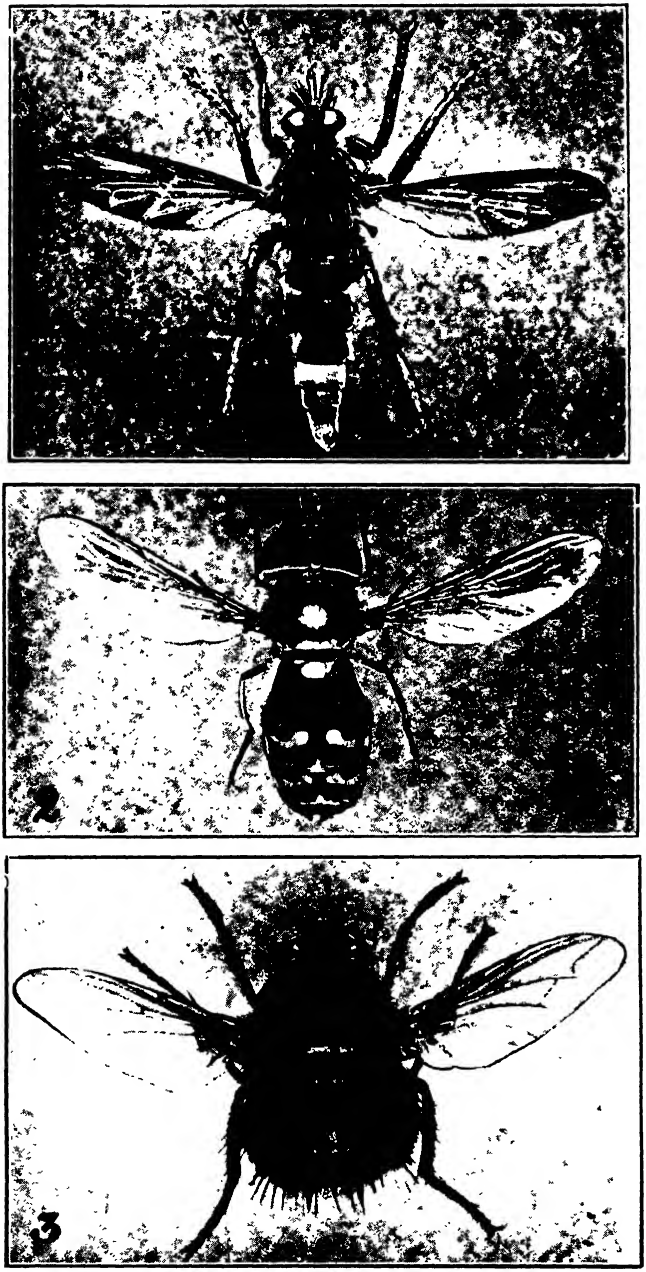


Fig. 11.— A Solitary Wasp.
(*Eumenes coarctata*).

Fig. 12.—Life-Cycle of a Ladybird.

Larva (1), pupa (2) and perfect insect of *Coccinella bipunctata*.

Fig. 13.—Types of Useful Two-winged Flies.



1. Robber-Fly (*Asilius crabroniformis*). 2. Hover-Fly (*Syrphus pyrastri*). 3. Tachanine-Fly (*Echinomyia grossa*).

Fig. 14. —The Nest of *Eumenes coarctata*.

Fig. 15. A Digger-Wasp dragging a Caterpillar to its burrow.

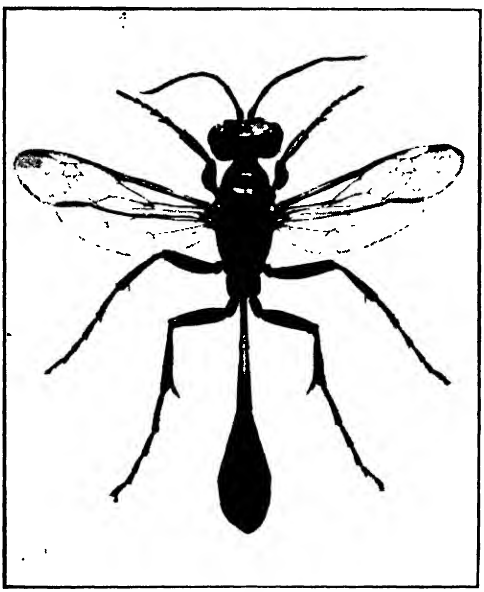


Fig. 16. A Digger-Wasp (*Ammophila sabulosa*).

Fig. 17. Pupae of large cabbage white butterfly showing holes through which parasites have issued.

Fig. 18.—Some of the parasites *(Pteromalus puparum)* which escaped from the pupae shown in Fig. 17. (Much magnified.)

But *Ammophila sabulosa* (our largest species), with its long "waist" and scarlet belt—relieving the sombreness of its otherwise black livery, seems a totally different insect. (Figs. 15, 16.) Yet the expert is able to point to certain details of structure which serve to establish mutual relationship.

ICHNEUMONS.

Altogether, British solitary wasps must accomplish much good work in checking the increase of pests. Yet their services in this respect seem relatively unimportant when contrasted with those of the parasitic ichneumons and their allies. These insects (which form several families) are also members of the great order Hymenoptera—of which the bees, wasps and ants are the most familiar examples. The ichneumons proper are slenderly built insects, with long antennæ, and restless, inquisitive ways. They lay their eggs either in, or upon, the bodies of other insects—the caterpillars of moths being most often chosen for the purpose. The female ichneumon is provided with an ovipositor which is frequently conspicuous—sometimes immensely long, as in the case of certain species which attack wood-boring larvæ, and are thus obliged to force the instrument through a considerable thickness of timber in order to reach their victims.

The habits of ichneumons vary so much in detail, and the species are so numerous, that only a brief, generalised description can be given here. Almost every kind of caterpillar has its ichneumon satellite—is lucky, indeed, if the number be not more than one. Generally speaking, the parasite grubs do not seriously affect the vitality of their "hosts" until their own development is complete. Did they do so, they would be liable to starve; for, as Dr. David Sharp has said, the host serves as a sort of intermediary between the juices of the plant on which it is feeding and the alien grubs inside itself. In fact, the host commonly preserves sufficient strength to assume the pupal state, and occasionally completes its metamorphosis—though this is rare. Almost invariably it perishes soon after the parasites have left it to spin their own cocoons; so that for practical purposes we may say that as soon as a caterpillar is "stung" by an ichneumon, its career as a potential link in the continuity of its species comes to an end, since its chance of reaching reproductive maturity is not one in a million. The large species of ichneumon often deposit only one egg in each victim, but many of the tiny species make one host serve for the rearing of a considerable family—as, for example, the industrious little *Microgaster glomeratus*

whose business lies with the caterpillar of the large cabbage white butterfly. It implants its ova in such numbers that when the victim is full-grown its skin may be literally packed with fat *Microgaster* grubs, and one marvels that it can contrive to live an independent life, even for the few hours that remain to it. Yet live it does, and creeps with its hidden burden to some wall or fence, where later its shrivelled body (or that of the unwholesome looking pupa that has replaced it) may be seen surrounded by the small, yellow cocoons of its tiny destroyers.

MINUTE PARASITIC HYMENOPTERA.

Besides the regular ichneumons, there are two other families of very small, but very useful, parasitic Hymenoptera. These (called *Chalcididæ* and *Proctotrypidæ*) comprise enormous numbers of species which are rarely noticed, save by the few entomologists who make them their special study. Yet they are of the utmost importance to agriculturists, since many of the species are very destructive to field and garden pests. For instance, in one season in the cotton fields of Northern Florida (unfortunately one has to turn to America for these interesting and instructive records) one species was estimated to have quelled the voracious "cotton worm" to the extent of 95 per cent. It accomplished this feat not by direct assault upon the caterpillars themselves, but by laying its own eggs *within those of the pest.* This fact speaks volumes for the exceeding minuteness of these parasites, whose habits resemble, on the whole, those of the ichneumons, but whose range of attack is much wider. Some, as we have seen, strike at the very root of things by destroying the eggs, while others attack larvæ and pupæ of many kinds. In Figs. 17, 18, are shown some pupæ of the large cabbage white butterfly from which hundreds of a species called *Pteromalus puparum* made their escape. They left nothing behind them but empty shells! Nor are adult insects exempt from attack. Some of the Chalcids oviposit in aphides, laying one egg in each.

PARASITIC TWO-WINGED FLIES.

Practically all Hymenopterous parasites may be classed as "partials," because each species restricts itself to victims of a particular kind. But with another large and important group of parasites the case is different. This consists of the two-winged flies which make up the sub-family *Tachininæ* (Fig. 13-3).. Their favourite victims are leaf-eating caterpillars, of which they must destroy enormous numbers each season. The eggs, however, are not laid in the

host's body, but are glued to its skin, and the newly hatched larva penetrates the egg-shell on its underside and bores its way into the victim. When they reach full growth, they leave the host, and pupate under cover of the last larval skin, which hardens to form a brown, barrel-shaped puparium. Attacked caterpillars occasionally survive; but the parasites almost always destroy some vital organ before they leave, thus causing death.

More than one detail in the habits of these Tachinine flies seems to indicate that their parasitic proclivities are of comparatively recent origin. First there is their impartiality. They do not select their victims with the ichneumon's unerring instinct, but utilise the first caterpillar that offers. Then they frequently fail in the matter of egg-laying. For instance, a fly will often glue her eggs to the back of a caterpillar that is on the point of changing its skin, so that skin and eggs are discarded together. So often does this happen that a very large number of eggs must be wasted by the parent flies. Furthermore, a fly will often attach three or four times as many eggs to a caterpillar as its bulk warrants, thus dooming many of her grubs to starvation and death, while others, from lack of adequate food, produce dwarfed imagines. Ichneumons, on the other hand, rarely make mistakes. Their methods of egg-laying are such that their chosen victims are almost always destroyed. Moreover, they seem never to fall into the error of putting all—or too many of—their eggs "into one basket." In view of these facts it seems possible that the Tachinine flies of years to come—their instincts sharpened by a process of natural selection—may prove even more serviceable to agriculture than those of to-day.

EARWIGS.

As a kind of tail-piece to this article, mention may fittingly be made of certain insects whose position in relation to agriculture and horticulture cannot, at present, be definitely gauged. To begin with, there are the earwigs. We have eight native species, but only two are sufficiently common to be taken into account, and of these one—the lesser earwig (*Labia minor*)—may also be disregarded in so far as the immediate interests of the farmer and gardener are concerned. We are left, therefore, with the common earwig (*Forficula auricularia*), which is very abundant—as everyone knows. Must it be numbered with the pests? Most people would answer unhesitatingly in the affirmative; nor can it be doubted that earwigs are responsible for much damage in field, orchard and garden, especially in years when they are abnormally numerous. On the

other hand, these insects are known also to destroy considerable numbers of small caterpillars, pupæ, slugs, etc.; so that they cannot be dismissed peremptorily as an unmitigated nuisance. Probably when the earwig population of a given district is not excessive, the mischief done is fully balanced by benefits conferred. But in the present state of our knowledge we are not justified in asserting this as a fact.

SOCIAL WASPS.

Next there are the social wasps—*the* wasps of the layman, since the solitary species referred to above lie beyond his ken. Every year brings its autumnal swarms of wasps, while in certain seasons especially favourable to their increase these insects become a veritable plague. This state of things is due to the facts that each "queen" wasp is capable of laying many thousands of eggs, and that the vast majority of these produce imperfectly developed females, or "workers," which play the part of builders, foragers and nurses to the community. In this way a few short weeks suffice to produce a large nest tenanted by thousands of hungry wasps and grubs—all directly traceable to the preliminary efforts and subsequent egg-laying of a single "queen." In its prime, such a nest will impose a considerable tax upon the orchards and gardens of the neighbourhood. There is, however, another side to the question. Adult wasps are certainly greedy for sweet juices, but they feed the grubs largely on insect fare. Thus, it is not without reason that Mr. O. H. Latter writes: "It is only when fruit is ripe that they do serious damage—granted that in a 'wasp year' the loss inflicted is very great; nevertheless in the earlier part of the season they are good friends to the gardener and fruit-grower, for they destroy enormous numbers of caterpillars, of green-fly and black-fly, and other harmful insects." We see, therefore, that even the wasp cannot be condemned out of hand, but that its case calls for careful investigation before sentence can finally be passed.

ANTS AND APHIDES.

In a somewhat similar position stands the ant, represented in this country by many species. Ants are very fond of nectar, sap—in fact, of any kind of sweet substance. They also kill and eat caterpillars and other insects, and avail themselves of such dead animal matter as they may find in the course of their wanderings. They may often be seen running in large numbers over vegetation. Nevertheless, they are innocent of any direct injury to plants.

Indeed, they accomplish a considerable amount of good by destroying pests of one kind and another. Little hesitation would be felt in recommending the ant to the goodwill of the husbandman were it not for its habit of fostering other insects on account of their palatable secretions. Ants are especially solicitous of the well-being of aphides because of the "honey-dew" which the latter provide. The ants guard the aphides with the utmost diligence, fight for them if need be, and in certain instances actually store up their eggs during the winter—bringing them out into the open again when the mild days of spring come round. Now aphides are a peculiarily feeble folk—soft, succulent, slothful, and (in many cases, at least) entirely defenceless. They live openly upon plants, apparently exposed to the attack of every passing enemy. Yet they have survived from very early times, and there is geological evidence to prove that their honey-dew was appreciated by ants in the mid-tertiary period of the earth's history. All things considered, it looks as though ant-patronage had been an important factor—if not, indeed, the dominant factor—in saving aphides from extinction. Could this be proved, we should be bound to admit that the prehistoric ant, by gratifying its taste for sweets and adopting very cute measures to secure an unfailing supply, did the modern agriculturist a very bad turn indeed.

III.—HOW THE DAIRY INDUSTRY HAS PROGRESSED.

By James Long.

MILK.

Although there has been a marked improvement during the last ten years in the prosperity of the dairy farmer who produces milk for sale, the advance has been effected rather by economic conditions than by an improvement in the quality of milk, or by a reduction in the cost of labour and feeding. A large proportion of the milk sold is as poor in its fat contents as it used to be, and there are spasmodic efforts so to alter the law that low quality may be maintained. Again, there has been no great improvement in the methods adopted for the maintenance of the cleanliness of milk, either by the employment of more suitable pails, by the use of the milking machine, or by milking in the open air. Milk is still badly cooled, and large quantities are spoiled in the hot summer months, while the imperfect

management of pastures and the passive rejection of forage crops, which play so great a part in the economy of the farm in other countries, are continual matters of regret. The better price of milk is owing to the increasing demand of an ever-growing population, and to the larger employment of milk as a food. The number of cows, too, has failed to keep pace with this growth; for the milking cattle of 1913 were but few more than they were in 1891. The result has been that large numbers of farmers, in order to sell milk, have abandoned the manufacture of butter and cheese, and so our imports of these materials are continually increasing. If, however, there has been no marked improvement in the quality of milk, there has been a distinct gain in the quantity yielded by cows, and it is probable that the average throughout the country, which was estimated at 430 gallons twenty years ago, is, to-day, from forty to fifty gallons more.

Progress will be made in the time to come from various causes. I look for a continued increase in the yield of the cow; an improvement in the quality of her milk; milk entirely free from pathogenic bacteria, and containing a largely reduced number of those responsible for early acidity; a reduction in the cost of labour; and the production upon the farm of a much larger proportion of food.

For some years the cows competing in milking trials—and I refer in particular to the Dairy Shorthorns—have produced milk containing a marked increase in the fat. Thus, taking the results of the competition at the Show of the British Dairy Farmers' Association in 1913 as a fair example, of ten cows, six produced milk containing over 4 per cent. of fat at one or more milkings, two of these exceeding 5 per cent., while still maintaining a high yield. Of eleven heifers, the milk of eight exceeded 4 per cent., and of these two exceeded 5 per cent. Of pure Shorthorns, twenty gave milk of similarly high quality. Between 1908 and 1913 the milk of the whole of the Dairy Shorthorn cows competing—ninety-eight in number—has averaged over 4 per cent. in the evening, and 3·6 per cent. in the morning, while the heifers and the pure Shorthorns have done almost as well. That the cultivation of this property is greatly improving our dairy stock there is not a shadow of doubt, while the yield of competing cows now varies, with few exceptions, from five to seven gallons a day. We have not yet produced those phenomenal milkers whose performances have occasioned the establishment of the Advanced Register in America, nor is it altogether desirable, inasmuch as so many fail to breed. If, however, breeding stock for the use of Dairy farmers can be secured, with or without the help of the Development Commissioners, from those

herds which have produced great performers at the pail, it will not be long before there is a general upward movement, both as regards the quantity and the quality of milk. Such a course should cause an extension of the dairy industry, not only as regards the manufacture of butter and cheese, but in establishing an export trade to those countries where buyers are anxious for milking properties. When we realise the fact that a cow yielding a large volume of rich milk, like the 2nd prize Dairy Shorthorn in 1913, or the 1st prize cow in the same class in 1914, produces 56lbs. of solid matter, fat, casein, and sugar in a week, against 26lbs., which is the approximate yield of the average cow of the farm, an incentive will have been given to farmers to insist on milking strains, and thus to establish herds of superior character. The time may then arrive when milk will be sold to the dairyman on the basis of quality, like the butter and cheese which it produces. As it is, there is a strong impression that in producing rich milk the volume is diminished, with the result that a proportion of that placed on the market approximates too closely to, or falls below, the Government standard.

Purity is as important as quality, and this may be secured in several ways. When visiting Switzerland in 1912, I was shown over the then new Zurich dairy—perhaps the most perfect in Europe—by my friend, the late Dr. Nicholas Gerber, who purchased the milk from large numbers of small cow-keepers, who combined to send it to the various stations. Every sample was tested, in addition to three laboratory examinations, by inverting sample bottles, with wide mouths, upon cotton wool pads placed under the disc stopper. This is an infallible guide, and it has led to a minimum of dirt. The West Riding and Cheshire investigations have demonstrated how seriously milk is contaminated; for, however perfectly the solid particles of dirt are removed, the milk is still soiled by their soluble properties. Cotton wool was shown to be the best of all filters, while the sieves and strainers commonly used were comparatively worthless. All investigations, however, point to prevention as the only source of purity. Dirt of all kinds may be prevented from entering the milk pail by one of two ways, and I am aware of no others. The milking-machine is not only a labour-saver and a stripper, but, if the teats are well cleaned before the cups of the machine are fixed upon them, the milk—coming, in a good machine, neither in contact with the hand nor the atmosphere—cannot be contaminated. A friend of the writer, owning a hundred cows, has employed a machine for three years, and, having seen it at work, I cannot speak too highly of the

results. Milk can be conveyed direct to the cooler or to the feeder of a separator, and practically skimmed direct from the cow. If, however, hand-milking is preferred, I know of no system equal to that adopted by Mr. Robert Mond, of Sevenoaks, whose investigations in relation to tuberculosis of the cow and its influence on milk are almost unique. The cows, when not in the fields (*e.g.*, in severe winter weather), are kept in chalk-floored and well-littered covered yards, adjoining the old cow-sheds, which have been restored, into which they are driven and chained up for milking. Before each milking, the stalls, walls, and gutters are well sprayed with a hose, as are the cattle themselves on their entrance. Ventilation is ample, and neither dust nor dirt can come into contact with the milk, which is drawn by men in clean white caps and smocks, from clean udders into pails which are covered with a lid as each cow is milked. The men rinse their hands in cold water when a cow has been milked, and convey the milk to a cold room in which it is cooled below 40 degrees, remaining there until it is sent away to the Infants' Hospital in London. Thus, while the milk contains a minimum number of bacteria, reproduction is checked by the low temperature to which it is reduced. Comparison with milk obtained morning and evening from another dairy proves how superior is one sample to the other. I have, for many weeks in succession, compared figures obtained from the hospital chemist, showing the condition of both and find that the milk from Sevenoaks keeps very much longer than that from the dairy. The great characteristic of this system is the abolition of the worst feature of most dairy farms, *viz.*: milking the cows in the building in which they live, breathe, and evacuate their manure, and which, under the most favourable conditions, is known to reek with dust, bacteria, and foul smells. New types of milk-pails have now been introduced, and the best of these— the mouth partially covered with a dome, but without a strainer—should be used by all who continue the practice of hand-milking. No expedient, however, will prevent contamination while the atmosphere in which the milk is drawn is impure, apart from the milking-machine, which is destined to diminish the labour bill, and render the farmer less dependent on the eccentricities of men who will not believe in the danger from dirt.

The food of the cow ought to be produced more extensively on the farm; an average dairy-farm ought then to keep more cows; while losses from drought might be much more completely avoided. Practically the size of a herd of cows is determined by the production of food in a bad season, on the principle that "it is better to be

over-cropped than over-stocked." It is a misfortune when, owing to a failure of crops, large quantities of food must be purchased for the herd. There is trouble, however, as each dry season comes round, and many dairy farmers have provided no substitute for grass. That the neglect of forage crops—lucerne and sainfoin in particular—should be so general, is incomprehensible. Lucerne is one of the main features of American farming; it is building up the cattle-breeding and milk industries of Argentina; it is a pearl of great price to the Frenchman and the Swiss. With forage plants and temporary pastures which are mown for the cows, the Swiss farmer knows nothing of drought, while the French tether their cattle on forage crops of all suitable kinds. Drought never affects lucerne, sainfoin, or maize, while temporary pastures consisting of clover, burnet, chicory, cocksfoot, 12lbs. at least to the acre, tall fescue, tall oat grass, and a little yarrow, with kidney vetch on the lighter soils, will produce abundant herbage in dry seasons owing to the depth to which their roots penetrate and supply themselves with water. These roots, too, by obtaining mineral foods from the subsoil, so enrich the surface soil that at the end of four years it is able to produce good crops of potatoes and corn.

During the winter of 1913 I visited large farms in Sussex, Warwickshire, Surrey, Dorset, and Wilts, on which great improvements had been made on very poor pastures by the liberal use of basic slag; thus increasing their value of 2s. 6d. and 5s. an acre to 10s. and 25s., and, while enabling the tenants to keep a great deal more stock, to reduce their expenditure for cake. By feeding, and thus stimulating the leguminous plants, the roots extend to greater depths, thereby obtaining water and mineral foods, and increasing the herbage to an extent which, in some soils, is most surprising, and this, too, at altitudes of 500 to 600 feet. Resort to these systems, combined with a more general resort to forage crops—adding oats and vetches, trifolium, and green rye to those named above, would materially assist all who keep cows to keep more, and at smaller expense. Kohl rabi, an excellent winter food for milk production, and a better drought resister than mangels or swedes, should also be cultivated.

BUTTER.

The increasing price of butter under normal conditions, the fact that we are so largely dependent upon imported supplies, and the almost entire absence of the finest class of butter from our markets, suggest that something should be done with the object of

promoting the extension of the industry in these islands. The movement for the improvement or reclamation of poor land, and of the increase in the number of dairy cattle, combined with the improvement in the quality of their produce, will, it may be confidently believed, result in the production of more and richer milk. The inevitable result will be an increase in the yield of butter and cheese. It is, however, of the highest importance that that increase should not, by its inferior quality, come into competition with imported goods. Our imports are of great value to the millions of our population for whom we cannot hope to provide, either in quantity or at the price which they are able to pay, but with growing wealth the number of consumers who are willing to pay for butter of the finest class is yearly increasing, and we are quite unable to meet their demands. Those who pay high prices for game, poultry, fish, fruit, and the rarer vegetables, are equally willing to pay for the finest butter and cheese, as they do in France, where I have seen the former sold in the Halles at 2s. 1d. a pound, and have known a Norman farmer who sometimes realised 2s. 8d. Although it will be admitted that this class of trade is not easily built up, it is not difficult to see that our home butter trade should be conducted upon this line. The average consumer has little conception of the quality and flavour of the finest home-made goods, nor of the difference which exists between them and the imported article. This much, however, may be said—and the opinion is based upon a long experience in judging, and of an annual examination of the samples exhibited at the London Dairy Show for more than twenty years—that if the finest Danish butter imported into this country, to take a single example, were placed in competition with English dairy-made butter, it would in all probability be unnoticed. I have indeed never seen a creamery sample which could take the first place against butter privately made. This points to the importance of improving produce on the farm.

The first point to consider is, "Will it pay?" One of the most difficult questions relating to price is found in the fluctuations in the various markets. Thus, during one week in July the price at Carlisle was 9d. a pound, while at Ipswich and Chichester it was 1s. 3d., and at numerous other markets, including Bristol and Norwich, 1s. 2d. On the same day the best French rolls, factory blended, were 13s. 6d. per dozen, the best Danish 118s. per cwt. and New Zealand 114s. per cwt. These facts are strange enough, but it is disheartening to find that, when English and Welsh butters were sometimes selling at 9d. to 10½d. per lb., Russian and Argentine

realised, wholesale, 105s. and 103s., per cwt., and were selling at 13d. and 14d. per lb. retail. The reason why home prices are so low is largely owing to lack of knowledge and proper equipment on the farm; if the position were fully understood makers could not be so foolish as to make so imperfect an article as many of them produce. Although fine home-made butter is much superior to that made in the creamery, the farmer cannot make it unless he is equipped for the purpose; hence, in hot weather, the creamery beats him with ease. As a rule, the highest price paid for imported butter is obtained for French rolls, which are made up on the blending or factory system by such firms as Bretel Freres, of Valognes, whose work I have had the advantage of witnessing on two occasions, and it is because of this fact that brief reference may be made to the practice of those farmers who produce for these firms. The finest French butter is made in the neighbourhood of Isigny, a small town in Calvados, near the port of Carentan, which is just over the border in the department of Manche. Staying in the very economical and comfortable inn at Isigny, I drove out to farms on which butter is made, and calves were reared on the skimmed milk, and realised to the full the advantage of the method adopted. The milk is set in conical "*terrines*," or earthen pans, some 14 or 15 inches in depth. These vessels stand in flowing water in a wide gutter round two or three sides of the milk room until the fleurette or first cream has risen. Heat is then turned on from the kitchen. the cool atmosphere is warmed, and the milk coagulates, preventing any further rise of cream. The cream is then removed, and is ready for churning, while the curd, much richer in fat than separated milk, is supplied to the calves which are fattened solely upon it for the markets of Paris, or kept on for stock. In warm weather the dairy is cool enough to prevent that rapid change in the milk that would otherwise occur. The cream is thick and ripe, and the butter, which is firm and sweet, is sold in the lump to the blending house. Thus, the practice of making up, and the consequent spoliation by long contact with warm air is avoided altogether, and the prices realised by the farmers are much better than those obtained by average English makers. There are many makers, however, with reputations, whose butter goes to Paris and the large provincial towns—the blended article coming only to England.

The manufacture of butter in England has been largely abandoned in favour of the sale of milk. Although the price of milk varies from 7d. to 8d. in summer, and 9d. to 11d. in winter, we may assume that the average price is approximately 8½d. a gallon. From this sum it is necessary to deduct the cost of carriage to the station, and

subsequently by rail. This work often involves the employment of a large portion of the time of one man and the whole time of one horse. The cost of churns for the conveyance of the milk is considerable; a refrigerator and a large supply of cold water must be maintained; while the work is kept at high pressure, in order that the milk may reach the station before the arrival of the train. It is highly probable that in the majority of cases the net value of the milk is thus reduced to 7½d., and in many others to 7d. a gallon. The question then resolves itself to this. Can the dairy farmer realise 7d. to 7½d. a gallon by the production of butter and the employment of the separated or skimmed milk for the rearing of stock? The answer depends entirely upon two factors—the fat contents of the milk and the skill and equipment in the manufacture of the butter. The business side of the question is, however, an all-important one, and it is here that so many makers fail. They have not the initiative which should take them into direct contact with the consumer, and they are content to sell their butter wholesale for what they can get on the spot.

The milking trials in London and elsewhere have conclusively shown that there is a large proportion of Shorthorn, Dairy Shorthorn, Devon, and Red Poll cows which produce rich milk, and no difficulty should therefore be found in forming a herd capable of producing 4 per cent. of fat. If we take this figure as a basis, and allow ·15 per cent. for loss in skimming, and ·05 for loss of butter in churning, we get a net weight of 3·8 per cent. Dividing this sum by ·86, which represents a fair percentage of the fat in British butter, we get 4·41 as the net weight of butter obtained from 100lbs. or 10 gallons of milk, containing 4 per cent. of fat. At 1s. 3d. per pound this would represent a sum of 5s. 6d., leaving nine gallons of skim and butter-milk for feeding calves, for which purpose its value is greater than when it is used for pigs. If we place this value at 1½d. a gallon we get a return of 6s. 7½d., equal to 8d. a gallon for the milk. While on the one hand, however, there are makers who would fail to realise 1s. 3d. for one of two obvious reasons, there are others who would realise more, and whatever steps are taken in the promotion of the industry, one should certainly be the realisation of a higher price for a prime article which so many are unable, like myself, to find in the locality in which they reside.

The retention of the skimmed milk on the farm would almost of necessity compel the producer to rear a larger number of calves. At no time has this practice been more desirable, for good stock has sold well. With young cattle to feed, an incentive is given to produce a larger quantity of forage on the farm, and the actual cost

involved in rearing is not felt to the extent that might be supposed. A good start having been made, a number of valuable heifers should be reared for sale as in-calvers every year, with a bunch or two of steers for feeding elsewhere, or, if it can be done with success, for feeding at home, thus making a return which, where the milk is all sold, would neither be attempted or realised.

While it is important that by the employment of rich milking cows, by controlling the food which they consume, by clean milking and equally careful control of the work in the dairy, the butter made should be perfect in colour, texture, and flavour, it is all important that the public should be shown what prime butter is like. Such butter is rarely found in the market or in the shops of provincial cities or country towns. At our agricultural and dairy shows, however, it appears with regularity, many of the exhibits being superb. But this does not afford a medium for education, as the public cannot sample the butter, either by paying for a tasting order or otherwise. The only possible way, under present conditions, is to purchase one or more of the exhibits, which in some instances is permitted, at the end of the Show, when they are tainted and stale. Exhibits of butter should be made in much greater weights—6 to 8 pounds—and samples sold to the public during the first or second day of the show while they are perfectly sweet. A sample might consist of an ounce, amply sufficient for the purpose intended, and this would provide for a hundred persons per exhibit, still leaving one pound uncut.

CHEESE.

The condition of the British cheese-making industry is well illustrated by the cessation of the exports from Holland, Switzerland, and, to some extent, from France and Italy—these four countries sending us the whole of the fancy varieties which find such a prominent place on the tables of wealthy people, as well as of hotels and restaurants in all parts of the country. It is quite true that there is not one of these varieties (which embrace Gruyere, Gorgonzola, Parmesan, Camembert, Brie, Port du Salut and Pommel, as well as the cheaper Edam and Gouda, popular among the working classes), which cannot be made in England; but it is equally true that so far from undertaking the manufacture of either, we are so much behind that the demand for our finest English makes is much greater than the supply. One of the largest London factors remarked, as I walked through his warehouse stored with cheese, that he could obtain plenty of second and third quality, but the one article which he required, the first, was always difficult to find.

Practically no prime cheese of British type is imported; the distance forbids it. The result is that the great market for that article is not supplied, consumers buying Continental cheese in its absence, while British made cheese, not of prime quality—and this probably forms nine-tenths of the whole—competes in the market with Canadian and Australian. Our Colonies are capable of supplying the great public which is unable to pay the highest price, but they leave us to provide for the very large class which always asks for the best, although, for reasons worth consideration, we are not able to meet the want.

Cheshire is the most famous cheese-making county in England, and, although Cheshire cheese is not so popular with the wealthier classes as Cheddar, it is the medium which has raised Cheshire farming, with the help of good land and good landlords, to the highest position. Cheshire farmers have proved that cheese-making pays, although their best customers are neither the aristocracy nor the greater middle class, but the operatives of Lancashire and the West Riding. The makers of fine Cheddar in Somerset, as in Ayrshire and Wigtownshire, are all prosperous men, and the same prosperity will attend all who follow their example and observe those conditions which the industry demands.

If the principles involved in the production of cheese were better understood the industry would expand, while farmers who are making to-day would obtain greater weights from the same number of cows. The evidence of the work at the Experiment Station at Geneva, N.Y., based as it is upon long trials with large quantities of milk, has shown, (and this has been substantiated by good work in this country,) that, contrary to old-fashioned belief, the richer the milk the greater the weight, and the better the quality, of the cheese. Many farmers still hold the opinion that milk comparatively poor in fat is the best for the work, contrary as this is, not only to common sense but to fact. Thus, if the quality of the milk produced by a herd of cows is raised by ·5 per cent. the output of cheese is raised accordingly, and there is therefore no reason why an average output of 4 cwt. per cow should not be increased to 4½ cwt. or still more. It follows that such a weight, if the quality is prime, may, at present prices—for 90s. has been reached as I write—enable a farmer to return £20 a cow for his cheese alone, this including the value of the whey, and in this he would do no more than thousands of French farmers who make cheese of much smaller varieties.

The English cheese-making industry is making no progress as a whole. Twenty-five years ago one of the most famous varieties, Leicester, was superb—excelled by none, equalled by few others.

To-day it does not exist, modern Leicester being of an entirely inferior character, nor have I seen a single specimen of the old type at Islington for a long series of years. The character of Gloucester and Derby cheese, neither of which are of high rank, does not enable either to take the place upon the London market to which they are presumably entitled, nor to obtain regular quotations in the weekly returns. Farmers, nevertheless, produce them, although at many shillings per cwt. less than Cheshire, Cheddar, and Stilton, and lose money in consequence. A large proportion of Stilton cheese is very inferior, and although the best quality realises 1s. to 1s. 1d. per pound wholesale, large quantities sell at 6d. to 7d. Wensleydale, although like Stilton, it is infinitely superior to Gorgonzola, is entirely superseded by the latter, which has so ready a sale in this country, and is frequently found at the Dairy Show and other agricultural exhibitions.

There is no reason why fine British cheese of all the leading varieties should not furnish an export trade, when our own demands have been met, as easily as Italian Gorgonzola and Parmesan, or the Gruyere of France and Switzerland. There are two methods by which progress may be made, and these are very briefly indicated. The production of inferior cheese is chiefly owing to a lack of initiative, due to ignorance of the principles governing manufacture and of the best practice. Many makers continue their work from year to year, without taking the trouble to ascertain where they are wrong by undergoing a course of instruction, or by paying visits to more successful makers than themselves. The most apparent remedy would be the temporary appointment of experts whose duty would be to visit cheese farms, in order to point out where the makers are at fault.

A further suggestion is in the same direction as that referring to butter. Cheese should be more frequently exhibited with the object of encouraging makers in a much more general way. To increase the sale of British cheese, the public should be induced to taste it, and thus to learn the great superiority of a fine sample over any other in the market. If it pays to advertise a good article, a plan which has built up half the great business concerns in the country, it is quite time that the principle was adopted with respect to cheese, but in a still more practical way.

PACKING FRUIT FOR MARKET.

By Ernest M. Bear.

The packing and marketing of his produce have assumed greater importance for the British fruit-grower as home and overseas competition have increased. It is only by careful attention to this department of his business that the grower can now hope to make the most of his crops. Many of the best growers have fully realised this, with the result that there has been a considerable improvement in marketing methods in recent years; but the rank and file have still much to learn, as is plainly evident to anyone who pays a visit to one of the large fruit markets. There are still too many growers who are content to fill the packages without taking the trouble either to weigh or grade the contents. As a result, in every season of plenty, we read of crops being left to rot on the trees because they are not worth gathering, or of fruit being unsold after reaching the market. In the experience of the writer, such disasters can be averted, if the produce be properly graded and packed, except, possibly, in the case of perishable fruit like strawberries. Fruit, when plentiful, may fetch low prices, but it can always be disposed of at some figure if presented in proper fashion. The grower who consistently packs well and fairly will gain a reputation in the markets and reap an ample reward, as his fruit will be preferred to that of his less careful competitors. There can be no question that the time and trouble expended on packing are more than repaid in regular sales and enhanced returns.

Nothing very elaborate nor difficult is called for in packing for market. The essential points may be summed up under the following heads :—

(1) Grading.
(2) Full weight and fair packing.
(3) Attractive appearance.
(4) Adherence to market customs.

Good grading is essential to good packing. It is not possble with all kinds of fruit, but is needed most for apples and pears, and sometimes for choice dessert plums. It may seem absurd that a sample of apples should sell better simply because specimens of different sizes are sorted out and packed separately, but such is undoubtedly the case. Certainly the appearance of the fruit is enormously improved in this way. In the mixed sample the large and handsome

specimens are lost amongst the small and blemished ones, while the latter appear worse than they really are by contrast with the former. Quite small fruit, when packed by itself, will often look attractive and find a ready sale.

With grading must go fair packing, or the advantage is lost. The grade must be uniform throughout each package. "Topping up" with large specimens is, fortunately, much less frequent than formerly, but there is still far too much of it to be seen in our markets. It is a dishonest practice and it does not pay. The retailer is certain to dive his hand down amongst the fruit to see whether the lower layers are as good as the top. "Honesty is the best policy" in packing for market, to put it on the lowest grounds. Care should also be taken to give full weight in each package. A great many growers merely fill up the baskets, and consider that they are quite fair in doing so, since the fruit is quoted by the bushel and half-bushel; but market salesmen are emphatic in declaring that each basket should contain a certain net weight of fruit. One well-known Covent Garden salesman supplies his clients with a list showing the weight of each kind of fruit which should be included in each package, and states that the best prices cannot be expected unless this rule be followed. Naturally retailers like to know what they are buying, and they are not slow to recognise and look for the fruit of growers who grade and pack fairly and give correct weight. Such a reputation is well worth gaining and keeping.

Attractive appearance naturally counts for something, and it can generally be gained by very simple means. The best grades should be selected for colour and freedom from blemishes as well as for size, and they should be placed in the baskets so as to present a level top, if possible. But it is with the choicest fruit, which is packed in small non-returnable packages, that attractiveness tells most; and it is not difficult to secure it by the use of fine wood-wool and tissue paper, as will be described later.

Adherence to market customs, though it may be less important than the other points that have been dealt with, is worth attention. Methods of packing which suit Covent Garden will answer for most other markets, but some have different customs, and then it is well to follow them. For instance, in some districts fruit is sold by the stone instead of by the bushel and half-bushel. Information on these matters can be had from the salesman. If he knows what kind of fruit is to be forwarded, he will send the best sort of "empties" for it, and, if asked, will state the weight he expects to find in each. As a rule, novel or unusual methods of packing are not appreciated, and should be tried only on a small scale, if at all.

As has been truly said, it does not pay to be a pioneer in this respect.

Apples.

Apples and pears call for more attention in the way of packing than any other hardy fruit, and the former are by far the more important in this country. Gathering needs supervision to prevent bruising, as the smallest damage shows prominently after the fruit has been off the trees a few days. The writer knows nothing better for gathering the fruit into than the boxes or trays commonly used for sprouting seed potatoes. These boxes are generally 2ft. long, 1ft. wide, and 3 ins. deep at the sides, whilst the ends, which carry a handle-bar, are 7ins. deep. They can be purchased ready made, or put together by the men in winter from wood bought ready cut to size. The advantage of these boxes is that, owing to their deep ends, they can be stacked one above the other in field, van, or fruit-room without any risk of bruising the contents, which cannot lie much above the level of the sides. Moreover, air can pass freely over each box, no matter how high they are stacked. In the fruit-room they can be piled from floor to ceiling, and serve admirably for storing the fruit. Experience proves that the fruit bruises much less in these than in the baskets frequently employed.

Apples must be brought into some building for packing, where there is a large table or bench of convenient height, and where there is no wind to blow the paper out of the baskets. The salesman usually sends bushel baskets (sieves) for cooking apples and half-bushels (half-sieves) for dessert varieties. These should be packed to hold 40 lbs. and 20 lbs. of fruit respectively, even if some of the smaller baskets have to be crowned up to take the weight. To prepare the baskets, the sides are first lined with strips of newspaper cut the right depth, or, better still, with a strip of stout blue packing paper sold ready cut for the purpose. A little wood-wool, or hay, is then placed on the bottom. Finally two sheets of coloured tissue paper are folded over the sides, leaving ample lap to cover over the fruit when the basket is full. Three sheets placed lengthwise serve for bushels, and two for half-bushels, one sheet being placed broadwise in the latter case. In most markets, pink paper is used to denote "firsts," blue "seconds," and white "thirds." When so prepared, the bushel baskets will be found to average 6 lb. and half-bushels 4 lb., and these weights should be allowed for when weighing the full baskets.

Having prepared his "empties" the packer places a box of apples before him on the bench, with a basket for "firsts" on his right

and one for "seconds" on his left. If there are to be "thirds," a basket for these can be placed in some handy position, and there will probably have to be other receptacles for damaged and rotten fruit. The apples are then taken from the box one by one and graded straight into the baskets. This is better than turning them out on to the bench, as it involves less handling and bruising. Some large growers are now taking to the use of mechanical graders, of which there are several ingenious patterns on the market; but the writer does not favour these, as they grade solely according to size, without regard to quality, colour, and freedom from scab or other blemishes. Absolute uniformity in size is by no means necessary. It is far better to put into the "firsts" a few medium-sized apples of good colour and shape than to include large green specimens or any badly disfigured with scab. Nobody wants dessert apples to be very large, but colour is most important. Thus a certain amount of mixing of sizes does not matter, provided always that care be taken not to make the top layer better than those lower down; but in general appearance the "firsts" will always be larger than the "seconds." None but ripe, clean apples should be placed in the best grade. Only with choice dessert varieties is it worth while to make "thirds," to take any fruit that is too small or too ugly for the "seconds." In seasons of scarcity "thirds" sell well, but in ordinary years the grower must be guided by returns as to whether it pays him to market them. It is a great advantage to make "thirds" when the returns justify it, as this leaves the "seconds" so much better.

The apples are placed in the baskets one by one, being built up in layers, each layer being started round the sides of the basket. This should be, at any rate, the case with the "firsts" and "seconds" of dessert varieties. "Thirds" can be simply filled into the baskets, and the same treatment is usually good enough for the "seconds" of cooking varieties. In placing the apples the packer should decide whether they look better on their sides or eyes upwards. The latter position is generally better, but the former suits tall fruit with most of its colour on the cheek. When the basket is full the weight is adjusted and the top made as level as possible.

To complete the packing the overlapping tissue paper is folded over the fruit and tucked in round the sides of the basket, and a layer of wood-wool or hay placed on the top. The orthodox method of keeping this hay in place is to fix two benders cross-wise over it, their ends being thrust under the rim of the basket. Another plan is to tie a sheet of newspaper over the hay or wood-wool, and this is easier if the baskets are rather well filled.

APPLES IN BOXES.

This article would not be complete without some mention of the system of packing apples in non-returnable boxes, which has been developed to a considerable extent within the last four years. English fruit-growers have often been reproached because they grade and pack their fruit in a style inferior to that adopted by American and Colonial growers who export apples to this country. These overseas growers have been obliged to discover the best methods of packing their produce to ensure its reaching our markets in good condition after its journey of thousands of miles, and they have found the non-returnable box and barrel most suitable for their purpose. On the principle that a method of packing which so well serves our foreign and colonial competitors ought to be best for home-grown produce also, a movement to encourage its adoption was started a few years ago by the authorities of the South-Eastern College, Wye, Kent. The idea was taken up with enthusiasm by a number of growers in Kent, with the result that an exhibition of boxed apples was held in connection with the Ashford Fat Stock Show of 1911. So much interest was aroused both by the splendid quality of the fruit and the novel method of packing, that the show was repeated in the following year at Maidstone, when the number of boxes displayed was more than doubled. There was a further large increase in the dimensions of the show in 1913, when the event again took place at Maidstone, over 30 tons of apples being exhibited in 1,293 bushel boxes and 148 barrels. Most of the fruit was staged by Kent growers, but there were also entries from Sussex, Surrey, Cambridgeshire, Middlesex, and Herefordshire. It was fully anticipated that a still larger and better show would be made in 1914, but it unfortunately had to be cancelled on account of the war. As a result of these Kent Commercial Fruit Shows it may now fairly be claimed that many English growers are capable of packing apples at least as well as their overseas competitors, whilst the quality of the home-grown fruit is distinctly superior.

At the same time, a fair number of Kent growers have made practical tests of this method of dealing with fruit, having placed on the market apples packed in non-returnable boxes. Most of these growers express themselves as satisfied with the enhanced returns thus obtained, but others have been disappointed. Some have come to the conclusion that the plan is suitable for choice dessert varieties, but that it does not pay with cooking apples. Returns of wholesale prices at Covent Garden indicate that the boxed fruit, speaking generally, realises about 1s. 6d. to 2s. more per bushel than the same varieties in baskets. This difference is none too

much when all the facts are considered. In the first place, the boxed fruit is of distinctly higher grade, because none but most carefully selected apples are packed in boxes. It is thus worth more, apart from the system of packing. Secondly, there has to be placed against the increased price the cost of the non-returnable box (sixpence). Thirdly, the work of boxing requires more skill and occupies more time. Lastly, apples for boxing must be without blemish and of perfectly uniform grade; which means that their selection from the bulk leaves a larger proportion to be disposed of as second grade fruit than under the old system. Thus the margin in favour of boxing appears to be narrow. It would not be wise, however, to attach too much importance to this at the present stage. English boxed apples have still to make a market for themselves. Only a few of the salesmen are yet prepared to handle them, and they have to make their way with the retailer and consumer. The trade with high-class stores, hotels, and restaurants is no doubt capable of great development, and there is something more to be done with steamship companies, some of which have already proved to be good customers. More hopeful still is the prospect of developing an export trade. A few of the Kent growers have already disposed of some of their fruit on the Continent, both directly and through London salesmen, and they have been satisfied with the results. English boxed fruit has found its way also to South Africa and the Argentine. For all such special purposes there can be no doubt as to the advantage of the non-returnable box, but it seems unlikely that, for general trade in home markets, it will ever displace the familiar baskets supplied by salesmen. After all, it seems absurd that, to reach a market only a few miles away, we should adopt an elaborate style of packing found necessary for fruit having to travel thousands of miles over the sea. Wherever there is a demand for extra choice fruit at prices remunerative to growers for their trouble and expense, the box should be tried, for it certainly enables the grower to display the fruit to better advantage than in baskets. But the smaller markets, though they appreciate grading up to a certain degree, will not recompense the grower for carrying it to the very fine point involved in boxing.

Space will not permit of a detailed description of the method of boxing apples. It will be sufficient to state that boxes of a standard size, holding about a bushel of fruit, are used, and that the apples are arranged according to definite packs or plans, which have been worked out to suit apples of various sizes and shapes. The aim is to get the apples fitted in as firmly as possible; and to keep them

in place they are slightly crowned up so that, when the lid is nailed down with the aid of a press, both lid and bottom have a slight bulge. Those who are interested in the boxing of apples cannot do better than apply to the South-Eastern College for a pamphlet on the subject.

There is a limited market for extra choice dessert apples tastefully packed in small non-returnable boxes holding a dozen. In some seasons this method pays well, especially with a choice variety like Cox's Orange Pippin. The process of packing will be explained when dealing with pears.

DOES STORING PAY?

One question which the grower has to decide is whether to sell all his apples as they are gathered, or whether to store some for sale during the winter. He should be influenced largely by the state of the market. In a season when apples are scarce and selling at satisfactory prices there is little temptation to keep them long on hand, this being always attended by some risk of loss or waste. It is different in a year of plenty and low prices. There is then every inducement to store the fruit in the hope of subsequently realising better prices. A further advantage is that it enables the grower gradually to work off all his fruit in his best market. But there are other considerations besides the state of the market which must not be lost sight of. Is the sample of apples good enough to store, and is there suitable accommodation? Several of the late varieties of apples, both dessert and cooking, keep well if they are ripe when gathered, free from bruises, clean, and healthy. If they are gathered too soon they are sure to shrivel, and if they are bruised, or have the skin perforated ever so slightly by insect pests, many are certain to rot before long. Fruit showing much scab is also unsuitable, as this disease develops in storage and the fruit eventually rots.

Proper accommodation is naturally important, indeed essential. The ideal fruit room is a frost-proof building which can be ventilated at will without undue draught, and from which strong light can be excluded. An important point is that it should have an earth floor, as this gives just the right degree of moisture to keep the fruit plump. An existing farm building can often be adapted as a fruit room by making the walls and roof double. No place could be worse for storing apples than the dry lofts often used for the purpose on farms. Here the fruit is bound to shrivel. A cellar is generally much more satisfactory. A low, even temperature, provided that it does not go below freezing, and a slightly moist atmosphere are both required. It is essential to have the conditions

right, as it may be necessary to store the fruit for a long time in order to gain any advantage in price. Experience proves that it seldom pays to store apples unless they can be kept until January or February, when the supply of American apples has fallen off. Prices seldom rise high enough before Christmas to compensate the grower for the labour and probable wastage. The work is considerable, as the fruit must be most carefully looked over, and only perfectly sound specimens selected for storing, the rest being marketed at once. Then there is a second handling when the fruit is taken out of storage. However, in some seasons there is undoubtedly ample reward.

PEARS.

Pears are packed in exactly the same way as apples. Choice dessert varieties go in half-bushel baskets holding 20lbs., and the coarser and cheaper kinds in bushels of 40lbs. It is essential to pack them before they become fully ripe—whilst still hard, in fact, —since they are too perishable when ripe and rot too rapidly to suit the retailer. They ripen after gathering better than the majority of apples; indeed, it is necessary that late varieties should do so, as the season is not long enough for them to mature on the trees.

Where really choice dessert varieties are grown, the most handsome specimens should be selected for boxing, since these often answer well for attractive packing. The boxes are non-returnable, and have to be purchased by the grower. They hold from six to twelve pears, packed in a single layer. The method of packing is as follows: Cut some pink tissue paper to fit over the sides and ends, leaving sufficient overlap to fold back over the fruit. Having thus lined the box, put in a layer of fine quality white wood-wool, forming a fairly thick bed for the fruit. Settle each fruit down into this, making as full and even a layer as possible. Pears usually go best head to tail. A better appearance is given if each fruit be half wrapped in white tissue paper. Having completed the layer, fold the paper over the fruit, cover this with a little wood-wool or a sheet of wadding, and nail on the lid. On the outside put a label stating the variety and the number of pears contained, or write these details on the box. If properly packed, with a sufficiency of wood-wool, the contents should be quite firm and should not move on shaking the box. The lids are made in two pieces, which should be nailed only to the ends of the box with one nail at each end, so that the lid may be easily removed without breaking. The boxes are corded together in convenient numbers for sending to market.

PLUMS.

Only the very choicest and finest of plums permit of grading. The majority are packed direct into half-bushel baskets in the field —in fact, they are gathered into them. No paper nor packing material should be used in the baskets; they are simply filled, and the weight adjusted to 28lbs. net. A sheet of pink or blue tissue paper is then laid over the fruit and tucked in round the sides, and two flat benders fixed cross-wise over this, as for apples. Benders are made by splitting coppice wood. They should be pointed at each end, so that they fix firmly under the rim of the basket, and made of such a length that they have to be bent slightly to get them into place.

Where there is an extra fine ripe sample of a choice variety to deal with, such as greengages, Victoria's, or Coe's Golden Drop, it is worth while to grade the fruit, sending the best in peck baskets holding 12lb. net. Only the largest fruit must be packed thus, the rest going in half-sieves, as described above.

In the case of very handsome, high-class fruit, grown on walls, chip punnets should be tried, placing a single layer of plums in each, without regard to weight. The punnets are then packed firmly in boxes, as will be described later for strawberries. There seems to be no reason why chip baskets with handles should not be tried for choice dessert plums, but market customs have to be regarded, and it is quite possible that they would not sell so well in these as in pecks.

CHERRIES.

These are packed in the same way as plums, but the half-bushel basket holds 24lbs. of fruit in this case. Large dessert cherries and the soft Morellas may be packed in pecks of 12lbs. No packing material is used, the cherries being simply covered with tissue paper kept in place with benders, as described for plums.

STRAWBERRIES.

Strawberries are the most perishable of all fruit, so must be handled with great care and got on to the market with as little delay as possible. For this reason they are best gathered very early in the morning and sold the same day. In order to reduce handling small non-returnable packages are essential. Chip punnets are universally used for the earliest consignments, and the oblong chip basket with a handle, holding from 4lb. to 6lb. of fruit, has largely displaced the round wicker peck for the bulk of the crop. Strawberries turned out of pecks on to the shop stall

are never worth eating; they cannot stand the treatment, and are always wet and bruised. Such fruit realises low prices nowadays, and it would be well if the peck disappeared altogether from this trade.

The very earliest strawberries are packed in shallow punnets, about 6 inches across and 2 inches deep, holding no particular weight. The fruit is carefully arranged in these, and a few strawberry leaves are placed around the fruit to give it an attractive appearance. Soon these shallow punnets give place to deeper and narrower punnets which hold 1lb. of fruit, and should be packed to hold that weight exactly. No leaves are required in filling these.

Strawberries should be gathered into the baskets in which they are to be marketed, even if these be punnets. To gather the fruit into a large basket for removal to the packing-shed, in order to place it in the punnets, involves too much handling. It is a mistake to bring the strawberries together in bulk at any time, as their own weight is enough to take off the bloom and freshness. The punnets should be distributed along the rows, so that the pickers can place the fruit straight into them. The punnets can then be lifted into shallow boxes and carried to the packing-shed, where the weight can be adjusted and the fruit and leaves (if any) arranged without much disturbance. The punnets are finally packed in boxes holding one or two dozen. Salesmen will supply these. If there is room for more than one layer, a light wooden division is placed over the first and the second layer is arranged on that. The punnets must fit firmly into the box, paper being used to wedge them where needed. The lid should be tied on, not nailed.

Chip baskets, which should come into use for the bulk of the crop after the punnet trade has ceased, are easily packed. The fruit is picked into them, after which the weight merely has to be put right in the packing shed. See that they contain exactly 4lb. or 6lb., according to the size of the baskets. The pickers must be instructed to discard any mouldy or slug-eaten fruit. The chip baskets are finished off by tying over the top paper on which is printed the grower's name and address, this being sold for the purpose. Sometimes such baskets are fitted with card or chip lids, but the paper is handier. The baskets are placed as they are in the railway van.

RASPBERRIES.

Raspberries, like strawberries, should always be packed in non-returnable baskets, except in the case of jam fruit, for which small

tubs are generally sent from the factories. The best dessert fruit is gathered with the strigs or stalks and packed in 1lb. punnets. The berries are snipped off with scissors into the punnets, and a few leaves arranged round the sides. The punnets are then packed into boxes holding six or a dozen, as described for strawberries. The demand is limited for raspberries packed in this way; only fine fruit should be so treated and the market tested. The bulk of the crop is sold for cooking. For this purpose the berries are picked without the strigs and put straight into 4lb. or 6lb. chip baskets with handles, finished off as mentioned for strawberries.

GOOSEBERRIES.

These are an accommodating crop, as they can be marketed at any stage in their growth, from the smallest green gooseberries to the ripe fruit. The very earliest green fruit realises high prices, and is worth packing in handled chip baskets holding 6lb. Later on, peck baskets of 12lb. are used, and, still later, half-bushels of 28lb. net. The best covering, because of the freshness it gives to the green berries, is long grass or the leaves of rhubarb or cabbages, kept in place by crossed benders in the case of the round baskets, or by cross stringing with a packing needle in the case of chips. Failing these green packing materials, the chips can be finished off as for strawberries, and the fruit in the other baskets covered with a sheet of tissue paper tucked in round the edge, with a little hay on top kept in place by benders.

The bulk of the ripe gooseberries are put into half-bushel baskets holding 28lb., with tissue paper tucked in over the fruit and secured by benders. Specially fine dessert fruit may go in 6lb. handled chip baskets, or, if extra large, even in 1lb. punnets finished off in both cases as for strawberries. The best way to obtain fine dessert fruit is to thin out the crop early, marketing the thinnings as green gooseberries.

CURRANTS.

Red and white currants are marketed like ripe gooseberries, the bulk going in half-bushels holding 24lb., simply covered with tissue paper secured by benders. Place no packing material in the baskets. The use of chips is, however, increasing, these holding 6lb. to 8lb. The currant is not a favourite dessert fruit, but an extra large sample, especially of the white variety, may be tried in 1lb. punnets.

Black currants are a more important crop. These are nearly all marketed in half-bushel baskets holding 24lb. A large proportion

of the crop is used by jam-makers and manufacturers of dye. The only packing required is to tuck in tissue paper over the fruit and secure with two benders.

COB-NUTS.

The most convenient package for these is the shallow basket known as a flat. These baskets vary in size as sent out by different salesmen, so that the weight of nuts to put into them must be ascertained by trial, the greenness or dryness of the nuts also having its influence. It is very important to state the weight correctly, as cobs are quoted by the lb. Weigh each empty basket, so that the net weight of nuts can be stated with certainty, and, if the fruit is green, allow 1lb. or more for shrinkage through drying. Place newspaper over the nuts and tie down the lids very securely, as no fruit is so liable to be pilfered on the journey.

V.—NOTES ON SOME WEST COUNTRY SOILS.

By C. T. Gimingham, F.I.C., University of Bristol: Agricultural and Horticultural Research Station.

PHYSICAL PROPERTIES OF SOILS.

As the study and investigation of soils has developed, it has become increasingly evident that particular attention must be given to their physical or mechanical properties. These properties depend in the main on three things—(1) the relative proportions of coarse and fine particles in the soil, (2) the amount of organic matter, and (3) the amount of calcium carbonate (chalk or lime) present. In a virgin soil the first of these will be determined entirely, and the third almost entirely, by the nature of the rock from which the soil was formed. The second—the proportion of organic matter—will be determined by the nature and abundance of the vegetation, which in its turn is dependent partly on the climate, and partly on the physical and chemical characteristics of the soil. It is often said, however, that, while all this may be true of virgin soils, yet in an old-cultivated country like our own the soil has been so changed by the manuring and liming of many generations that its origin is no longer a matter of interest. Nevertheless this is an incorrect view. With the possible exception of a few soils which have been devoted to market gardening for very many years, both

the fertility and the kind of cultivation required for successful farming are affected in most important ways by the nature and composition of the mineral constituents of the soil. The geological formations, or substrata, from which soils are in the first instance derived, are therefore of the greatest interest and importance, not only scientifically but also from the practical point of view. It is with the geological aspect of the study of soils that these notes are to a large extent concerned.

THE FORMATION OF SOILS.

Nearly all rocks are to a greater or lesser extent permeable to water and air, and when exposed to considerable variations of temperature they tend, although in some cases extremely slowly, to break down into smaller and smaller fragments. Water which has got into the minute cavities in the surface of the rock, on freezing, expands and the pressure thus exerted is, perhaps, the most powerful agent in the early stages of soil formation. Breaking up of the rock surface is also aided by the solvent action of the rain water, which contains carbon dioxide, and by the growth of roots as soon as there is foothold for the pioneer plants. It is not necessary here to go into details with regard to the complicated weathering processes by which a fertile and deep soil is finally produced.* It will suffice to mention that the transporting action of running water, of wind, and of ice, the mechanical washing of heavy rain, the activities of animals, insects, plants, and bacteria, all play their parts in forming soil and subsoil from the surface of the rocks.

All soils, without exception, have been produced in the first place by means such as those here indicated; but it by no means follows that all soils now rest on the particular substrata from which they actually originated. The action of wind, or of water, or of ice, has in many cases moved soils and sub-soils considerable distances from their place of origin, so that they no longer bear any direct relation to the underlying rocks. For example, a great part of Britain is known to have passed through one or more glacial epochs and during these periods large areas were covered by surface deposits of clay and sand carried from other regions by the slow movement of the ice. Again, in certain parts of Europe and of America, there occur soils of very uniform texture, which have been accumulated from some distance away by wind action.

We have, therefore, to distinguish carefully between transported soils (known technically as drift soils) and soils formed *in situ*,

* See, for example, Russell, *Jour. Roy. Ag. Soc.*, 1913–14.

i.e., those which are seen to have been derived directly from the geological formation, which is still immediately below them (sedentary soils).

Though this distinction is normally a perfectly obvious one, it has to be borne in mind that even sedentary soils are not entirely free from extraneous materials, especially in a country like Britain where geological formations are frequently exposed in very narrow outcrops. Near the junction of two formations, soils may frequently be encountered which are of mixed origin and which are not typical of either formation. Nevertheless, for the most part the substratum will determine the character, both chemical and physical, of the soil; and the farmer's division of soils into sands, loams, and clays, is found to accord fairly well with the nature of the rocks below. A more accurate classification is obtained by means of mechanical analysis.*

SOILS AND GEOLOGICAL STRATA.

The relationship between soils, and the geological strata which underlie them, is nowhere better seen than in some of the Western counties, since the majority of the soils are sedentary, and there is no confusion caused by the presence of glacial drift.

Mr. A. D. Hall, in one of his books, speaking of a farming journey in 1910, says, " What, perhaps, we had hardly been prepared for was the great variety presented by British farming and the diversity of the methods that are practised. Great Britain is not a very large country, and the variations of climate and soil which occur within its limits might be considered trifling by men accustomed to continental areas, yet every few miles of our journey we found ourselves in a totally different country from a farming point of view."† These remarks apply with very special force to the western part of England, and if we study the geological survey maps of the western counties we are presented with a positive kaleidoscope of colour, so intricately mixed are the exposures of the various formations, which include almost every stratum from the Devonian to the Chalk, in addition to many of the recent deposits. Unfortunately, for all except a very small part of the area, the maps available show only the solid geology and do not indicate the more recent and superficial strata which, from the agricultural point of view, are of particular importance.

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* The significance and value of the mechanical analysis of soils is briefly discussed in the previous volume of this Journal, p. 142.

† " A Pilgrimage of British Farming," p. 145.

No real start has yet been made with a systematic soil survey of the Western counties, though the value of such a survey would be very great. A knowledge of the chief soil types in each district is, indeed, essential in order to make full use of the results of isolated soil analyses. It is, however, a work of considerable magnitude, and a serious soil survey of an area of the size of the Bristol agricultural province, possessing, as it does, such complicated geological features, cannot be undertaken without proper provision being made for the routine analysis of the very large number of samples which it would be necessary to examine. A preliminary skeleton survey would be of little use—probably the best way to deal with the problem is to split up the province into comparatively small districts, each one of which could then be separately surveyed in a thorough manner.

The writer has recently had an opportunity of examining a number of typical soils in Gloucestershire, Somerset and Wiltshire, and some of the notes gathered may perhaps possess interest if it is only to demonstrate the great variation of soil types and of farming within comparatively small areas.

These soils have not been sampled with the objects of a soil survey in view, but they are characteristic of a few of the geological formations occurring in the counties referred to. The notes have been put together in the hope that they will serve to illustrate the way in which a scientific study of the soil may help to explain or elucidate problems and practices of farming, and to indicate the kind of information which it is hoped gradually to collect and co-ordinate with reference to all the important soil types of the area.

WEST COUNTRY SOILS.

To begin with the older formations, we find the *Devonian Slates-with-Grit* extensively developed in West Somerset, where it gives rise to a coarse-grained soil full of small pieces of slate. The surface soil varies a good deal in depth, but is often shallow, a subsoil of broken slaty rock mixed with a little finer material appearing in many places at a depth of less than 12 inches. Elsewhere there is a deeper, rather more tenacious, soil of higher value. Speaking generally farming on these soils would appear to follow the old four-course Norfolk rotation: it is essentially sheep and corn land, dairy cows being kept only to supply local requirements. There is a really pressing need for liming. The soils on this formation, and also on much of the other land in West Somerset, contain only the minutest quantities of lime, and unfortunately lime

TABLE I.

MECHANICAL ANALYSES.

Surface Soils.	Keuper Marl.				Rhaetic Beds.		Lower Lias.		
	1 Pasture	2 Pasture	3 Arable	4 Arable	5 Pasture	6 Arable	7 Pasture	8 Pasture	9 Pasture
Fine Gravel ..	0·73	2·65	0·94	2·97	—	2·03	—	—	0·53
Coarse Sand.. ..	19·36	13·37	9·61	7·16	6·53	13·48	1·92	1·61	6·09
Fine Sand	35·16	25·42	34·96	25·17	15·56	11·26	9·54	6·27	11·22
Silt	11·46	15·62	14·38	15·81	10·42	16·0	8·6	10·35	10·09
Fine Silt	16·50	19·55	21·21	24·62	22·95	19·87	22·79	25·96	13·39
Clay	5·10	9·5	10·16	15·31	25·92	24·8[illegible]	36·56	29·31	32·42
Moisture	2·4	5·38	2·48	1·79	4·86	4·0	6·45	5·94	5·92
Organic Matter ..	8·18	8·1	5·61	5·93	10·90	6·2	12·26	17·11	13·73
Carbonate of Lime..	0·43	0·51	0·35	1·91	0·13	0·38	0·14	2·41	3·7

The terms—Fine Gravel, Coarse Sand, etc., indicate separate fractions of the soil, each composed of particles falling within certain arbitrarily chosen limits of size, "fine gravel" being the coarsest and "clay" the finest.

is somewhat difficult and expensive to obtain in many localities. If systematic liming were carried out, it is certain that there would be a noticeable increase in the fertility of the whole district, and, among other results, an important decrease in the occurrence of "finger-and-toe," a disease which is all too prevalent.

Passing over the older beds of the Trias (not because they are unrepresented, but because only one or two soil samples from them have been examined), we come to the *Red Keuper Marls and Sandstones*, a formation of very great importance in our area. The soils to which it gives rise, "though sometimes wanting in calcareous ingredients, comprise deep reddish or reddish-brown marls, loams, and fairly stiff clays, that form rich meadows and pastures as well as fertile arable land." In places the soil is made more friable by the occurrence of strains of sandstone among the marls; and, though the variations in composition and fertility are considerable, there are but few spots on this formation where the soil is directly derived from the underlying rock, which cannot be said to be rich.

De la Beche in 1842* was, perhaps, the first to draw attention to the general fertility of the land on the red sandstone series of rocks, and he notes in his paper that there are good opportunities of observing the striking general superiority of the red marl and sandstone soils over the adjoining liassic or carboniferous soils, in the Vale of Taunton and elsewhere in Somerset. He also remarks that the red marl adjoining the lias appears to be particularly favourable for the growth of apples. Indeed, both Keuper Marl and Lower Lias Clay are good for fruit-growing—both formations occur, for example, in the Vale of Evesham. In the main, however, general farming is the rule on the Keuper soils, the pasture, in particular, being excellent and dairy farms numerous.

In Table I. the mechanical analyses of several soils derived from this formation are given (Nos. 1—4), and figures for others will be found in an article on Soil Analysis in last year's issue of this journal.† The high ratio of the "fine silt" fraction to the "clay" fraction is a feature of these soils; and the presence of so much "fine silt" accounts for a degree of stickiness, a difficulty of working and a tendency to form a very hard crust on the surface when dry, which are rather unexpected. Particles of the "fine silt" size show none of the colloidal properties belonging to "clay," and they are not

* *Jour. Roy. Agric. Soc.*, Vol. III. 1st Series.

† p. 145. "Report of the National Fruit and Cider Institute."

flocculated by lime.* Liming, therefore does not much improve the physical condition of these soils and the presence of plenty of organic matter will best ensure the possibility of getting a good tilth. Green manuring is undoubtedly a practice to be specially recommended.

With regard to chemical composition, all Keuper Marl soils which have been examined show an unusually high percentage of "total" potash. Table II. gives the figures for some samples from Long Ashton, near Bristol. It will be seen that the large total amount of potash is not accompanied by correspondingly high figures for the

TABLE II.

CHEMICAL ANALYSES.

(Keuper Marl Soils).

	1		2		3	
	Surface	Subsoil	Surface	Subsoil	Surface	Subsoil
Moisture	2·15	1·95	1·83	1·84	1·74	1·46
Organic Matter ..	4·91	3·06	4·48	3·18	4·99	2·67
Carbonate of Lime ..	0·3	0·11	0·42	0·075	0·09	0·01
Phosphoric Acid (Total)	0·111	0·103	0·119	0·099	0·113	0·093
Ditto (Available) ..	—	—	0·036	0·019	0·027	0·022
Potash (Total).. ..	0·669	0·895	0·658	0·676	0·666	0·816
Ditto (Available) ..	0·023	0·024	0·017	0·012	0·020	0·011
Oxide of Iron ..	1·92		2·01	2·16	2·16	2·52

"available" potash (*i.e.*, potash soluble in 1 per cent. citric acid). Moreover, there is evidence to show that the soils respond to dressings of potash manures. It is hoped to obtain further information on this point. It appears to be a case providing a good example of one way in which the results of a soil survey are especially valuable. Without some knowledge of the normal composition of this type of soil, the analysis of a single sample giving such a high figure for potash would probably cause the inference to be drawn that potash manures would be without effect.

All the soils on this formation possess the well known warm red colour; and this is certainly due to the presence of iron. A glance at the figures quoted in the table will show, however, what a small proportion of iron oxide suffices to produce the colour—actually there is less present than in many brown, grey, or even white soils.

* Hall & Russell, "Soil Surveys and Soil Analyses," *J. Ag. Sci.*, IV., p. 182.

Probably the intensity of the colour depends mainly on the manner in which the oxide of iron is distributed among the particles. It is a fallacy which dies very hard that red soils necessarily contain more iron than others; and it is certainly not to iron that their particular properties can be ascribed.

Geologically intermediate between the Triassic and the Jurassic rocks come the *Rhætic or Penarth Beds.* There is no very distinctive soil characteristic of this formation, possibly because its outcrop is usually narrow, and the soils tend to become mixed with material derived from one or other of the adjoining formations. Three samples have been examined. One, from a few miles south of Tewkesbury, is extremely like the heavier kind of Keuper Marl soil but apparently less fertile and very difficult and tricky to work: it gets into a hopelessly puddled condition if sheep are run on it, and, although fairly good bean land, it is often impossible to get the seed in at the proper time. Two straw crops are frequently taken consecutively. The other two samples were taken at Stawell and at Sutton Mallet in Somerset, and approach more closely to the Lias—they are brownish-grey in colour when wet, but on drying a faint red tint appears reminiscent of the Keuper. The mechanical analyses of the Stawell and Tewkesbury samples are given in Table I. (Nos. 5 and 6),

We come next to the *Lower Lias* formation which covers a large part of Mid-Somerset and of the vale country in Gloucestershire. The Lower Lias Limestones give, as a rule, stony, clay or heavy loam soils, whilst the Lower Lias Clays yield an extremely stiff clay soil and subsoil. In places the land is cold and poor; elsewhere the surface is more loamy and the land more fertile. It is now nearly all in grass and devoted to dairy farming—both Cheddar and Gloucester cheese is made chiefly on these soils. There are also many cider orchards, and market fruit growing is slowly on the increase. Where a surface soil of more loamy nature has been formed there is rich old pasture land with much accumulated organic matter—land that would yield great crops of wheat were it to come under the plough.

It is on this formation that the "teart" or scouring lands occur which cause serious loss to stockowners. Recent investigation has tended to show that this trouble is always at its worst where the very fine-grained clay soil comes very close to the surface; it is less or altogether absent where there is any depth of loamy or alluvial soil over the clay. The particular physical structure of the typical lias clay appears to exert an influence on the composition of the herbage, causing it to have a scouring action on animals of weak

constitution. This subject has been dealt with by Dr. Voelcker and others in former volumes of this journal, and a recent paper by the present writer is to be found in the Journal of Agricultural Science.*

The Lower Lias soils in the West are very characteristic, and show on the whole a fairly constant composition. Numerous analyses have been made and a few examples from Somerset are given in Table I. Quite similar soils have recently been examined from near Kilton, and from Edington, both in Somerset, and from near Hartpury and from Hardwicke, the one a few miles north and the other a few miles south of Gloucester.

Between the Lias and the Oolite there are connecting beds known as the *Midford Sands*. The formation is developed to some extent in the neighbourhood of Yeovil, and yields a very light, sandy soil, yellow in colour, which invariably is almost destitute of lime. Good roots and cabbages can be grown if the land is well treated, but, owing to the very open texture of the soil, bacterial action is extremely vigorous and organic manures are used up very quickly. For example, after close folding with sheep, one heavy corn crop can usually be taken, but very little is left for the next season's crop. Moreover, it is a fight against weeds on this land: both roots and corn are always in danger of being choked during the early stages of growth, and much of the land is in consequence going down to poor weedy pasture. With liming, and where there is a supply of dung and a convenient market, this is a type of soil that would probably make good market gardens.

The *Oolite* rocks, which come next, comprise a great number of sub-divisions, including sands, sandstones, and limestones, clays and shales: and many of these series are represented in South-West England. It is not possible without a very much more detailed study than has yet been made of the soils derived from these formations to make any kind of general remarks; and we must pass at once to the cretaceous rocks, and in particular the Chalk.

In Somerset and Gloucestershire the *Chalk* is of little or no importance; on the other hand, in Wiltshire it determines the agriculture of a large part of the county. It is difficult in the case of many formations to define a typical soil, but in the case of the Chalk it is impossible, so greatly does the composition vary when samples are compared from different localities. The writer has recently examined only four or five samples, but these are sufficient

* Vol. VI., p. 328. There is also an abstract of this paper in the Report of the University of Bristol Agricultural Research Station, 1914.

to show the greatest variations. Fortunately the Chalk soils of other areas have been closely studied* and more is known about these soils than about those from any of the other formations mentioned here.

TABLE III.

MECHANICAL ANALYSES.

(Chalk Soils.)

Surface Soils	1	2	3	4	5
Fine Gravel	1·01	1·95	—	—	—
Coarse Sand	2·11	13·25	1·38	0·67	3·99
Fine Sand	4·71	16·58	27·99	34·81	16·32
Silt	4·02	7·87	12·47	23·90	10·48
Fine Silt	4·73	8·42	10·03	9·56	9·85
Clay	3·40	6·20	18·71	19·72	21·06
Moisture	2·0	2·2	5·5	5·0	9·0
Organic Matter ..	(9·0)	(7·8)	5·0	4·6	7·8
Carbonate of Lime ..	64·0	31·8	16·72	1·4	17·9

The mechanical analyses of some Wiltshire samples are given in Table III. The first glance will show the very great difference in the proportion of chalk present, although in all cases the soils lie directly upon almost pure chalk rock. Further it will be observed that samples Nos. 1 and 2, which are from the neighbourhood of Salisbury, contain a much higher proportion of the coarser grades of particles than Nos. 3 and 4 from Clyffe Pypard. Different parts of the chalk formation obviously contain very different kinds of insoluble residue.

Although the texture of these soils is determined to a less degree than usual by the mechanical composition, owing to the masking effect of the high proportion of chalk, yet the differences referred to are great enough to have an influence on the character of the farming. Near Salisbury the normal practice is to run sheep on the "seeds," the land standing a great deal of trampling; at Clyffe Pypard, on the other hand, where the soil is much deeper, it is considered too heavy for trampling by sheep, and much of it is going down to permanent grass, giving in many places particularly sweet and nutritious herbage. The apparent heaviness of the soil in the latter samples appears to be due not so much to the very

* In particular, by Hall & Russell: "Agriculture and Soils of Kent, Surrey and Sussex," published by the Board of Agriculture.

finest grades of particles as to the particularly high proportion of "fine sand" which runs together, and is not flocculated by the chalk.

The details of farming on the Chalk are too well known to need discussion here.

Finally, we come to the Recent Quaternary or Superficial formations representing "various deposits laid down during the later geological periods, when the past and prehistoric, so far as man is concerned, merged into the historic and present." These include alluvium with peat, blown sand, estuarine and marine beds, valley gravel, brick earth, and glacial drift. Of these only some soils on the *Valley Gravel* will be briefly considered. Valley Gravel, as its name implies, has been deposited along the courses of rivers, and "often extends over considerable areas, forming a terrace, or series of terraces, or platforms, above the alluvial flats." In the West it also often occurs in patches, surrounded by alluvium. Soils on Valley Gravel naturally tend to partake to at least some extent of the nature of the neighbouring strata, but these deposits vary greatly even in the same river-valley, the only constant characteristic being the occurrence of a large proportion of stones and pebbles.

At Maisemore, near Gloucester, there is an area of Valley Gravel in the neighbourhood of the Severn—the soil here has a good deal in common with the Lower Lias clay, which lies directly below, but the mechanical condition is greatly improved by the admixture of gravel with the clay. It is a fertile soil giving good corn and root crops, but requiring careful treatment.

In the neighbourhood of Taunton, small areas of Valley Gravel also occur, particularly along the course of the Tone and its tributary streams. These give reddish soils often very stony, and resting at a slight depth on beds of almost pure gravel. It is on the whole rather poor, washed-out land, though under liberal treatment good crops of hay and roots are grown.

Another good example of a deposit of river gravel is to be seen along the valley of the Salisbury Avon. A soil from near Downton, and close to the river, shows a very coarse, gritty and flinty composition, and although it overlies the Chalk, is very short of lime. The land just here is liable to occasional flooding, and is very difficult to keep free from weeds.

VI.—THE ORIGIN AND IMPROVEMENT OF AGRICULTURAL PLANTS.

By S. Leonard Bastin.

The Antiquity of Selection.

There are so many wonderful things nowadays that the most attentive observer finds it a difficult matter to appreciate a quarter of the marvels which he sees around him. Naturally the more startling the invention, the larger is the amount of notice attracted by it. Even to-day, when the sight is a common one, we are thrilled as we watch a flying machine humming its way across the sky; and well we may be, for this is one of the most remarkable achievements of mankind. But it is a mistake to suppose that the most dazzling accomplishments are those which always render the highest service to the human race. Much of the well-being of our daily life is due to unobtrusive things of whose existence the average individual is hardly aware. In no direction is this more true than in the work of that specialist popularly known as the plant-breeder. But the work of plant improvement is, at best, a very slow one; and often enough the advantages gained at each stage are so slight that, the experimenter, unless blessed with an almost infinite amount of patience, might well despair. In many cases, the final outcome has little that is sensational about it; there is small chance of the achievement receiving even a modest paragraph in the newspaper. Yet that painstaking worker may have produced something which may well benefit the world as long as time lasts. It may, therefore, be of interest to consider a few of the leading plants grown by farmers, tracing their origin from early times and showing to what an astonishing extent they have been developed. In considering such a subject it is very important to rid oneself of the common idea that the improvement of our domestic plants is confined to the last few generations. The facts of the case are entirely the reverse. As is well known, plants are constantly varying, and a large part of the experimenter's work consists in simple selection. As the expert goes over his groups of specimens he picks out those most nearly approximating to the ideal which he has set before him. From these, the seed is saved for the new generation, and it is seen that great advancements in the characteristics of a plant can be made by simply adopting a system of rigorous selection. Even a savage usually knows a good thing when he sees it, and this knowledge would be utilised with the

dawnings of civilisation, when the cultivation of plants was first of all undertaken. So we may say that, from the earliest times, *there has been a ceaseless selection of the best in the case of those plants which mankind has grown for the sake of their food value or other purposes.*

THE ORIGIN OF THE CEREALS.

It is likely that of all plants grown for the use of man there are none of greater antiquity than the cereals. Indeed, it is not at all an easy matter to discover what the first plants of wheat, oats, etc., were really like. However, certain facts are known, and some of these are of great interest. For such an immense period has wheat been cultivated that all trace of the original home of the plant has been lost. The most ancient Egyptian records show that the cultivation of the wheat was then well established and, even in these distant times, its origin seems to have been unknown. As a rule, the creation of wheat was largely attributed to mythical individuals, such as Isis and Ceres. In a similar way the Chinese, who certainly grew wheat for three thousand years before the Christian era, regarded the useful plant as a gift direct from heaven. Almost the only fact about which we are reasonably sure is that the wild wheat (*Triticum vulgare*) existed in a few restricted localities, probably somewhere in Western Asia. If the species had been widely distributed before cultivation there would assuredly be descendants in distant countries. Now and again, stories of the finding of wild wheat have been circulated, but in every case that has been critically examined it has been found that the discoverer has mistaken his plant. Of course, in many parts of the world there are to be found certain species more or less resembling wheat, but these have been shown to be one or other of the various species of *Triticum.* None has ever been held by authorities to be the wild ancestor of the cultivated plant. Although the growth of the oat (*Avena sativa*) by man is nothing like so ancient as that of the wheat, it is doubtful whether even here the wild species has ever been discovered. As is well known to all farmers, oats have a remarkable tendency to scatter themselves on waste ground. Probably many of the so-called wild oats are simply cultivated types which have gone astray. Fairly near approaches to the cultivated oat are said to have been discovered in central Asia, and some botanists regard these as the true type. No mention is made of the oat in the Old Testament, and, although the plant was known to the Greeks and Romans, this seems to have been a matter of hearsay, the know-

ledge having probably been picked up from the Celts and Germans in the north. In one or other of its forms it is likely that barley (*Hordeum*) is the most ancient of all cultivated plants. No really wild examples have ever been discovered. Grains of this cereal have been found in the Egyptian monuments, and also in the remains of the Lake Dwellings of Switzerland.

THE IMPROVEMENT OF THE CEREALS.

Whatever the wild ancestry of our leading cereals may have been, it is certain that, at the present time, the varieties we possess are vast improvements upon the original types. In an article of the present description it is impossible to do more than treat of wheat in a general sense without touching upon the intricate question of varieties. Up to within comparatively recent times, the character of the plant was quite poor compared with that of first class modern kinds. It is likely that some of the first directed efforts towards the improvement of wheat were those of the Scotchman, Patrick Shirreff, who, during the early part of the 19th century, produced several distinctly valuable varieties; these were merely the result of the selection of the best plants. Hallett, of Brighton, showed that even better results were obtainable by choosing the finest grain of corn in the best ear of wheat. One example will show the advantages arising from this method. The finest grain from a particularly good ear of wheat was chosen. This ear had forty-seven grains in it. The best grain was again selected, and this time the ear had seventy-nine grains, whilst in the third year the number of grains was ninety. Exactly the same principle has been carried out in the case of oats at the Ontario Agricultural College. Thus some extensive trials showed that, when large seeds were chosen, the yield of grain per acre was sixty-two bushels; with medium seed it was 54·1, whilst in the case of small seed it was only 46·6 bushels per acre.

CROSS FERTILISATION.

The latest improvements which have been brought about in the case of the cereals (and indeed most plants), would not have been possible without the introduction of artificial cross-fertilisation. Curiously enough it is only within comparatively recent times that the true facts in connection with the pollination of our leading cereals have been known. For a long while it was considered that all the grasses were cross-pollinated simply by wind agency. Even to-day there is a widespread idea that, at the time when the corn is in

Fig. 1.—Old-Fashioned Type of Globe Mangel.

Fig. 2.—An Up-to-date Type of Globe Mangel.

Fig 3. The Development of the Carrot.

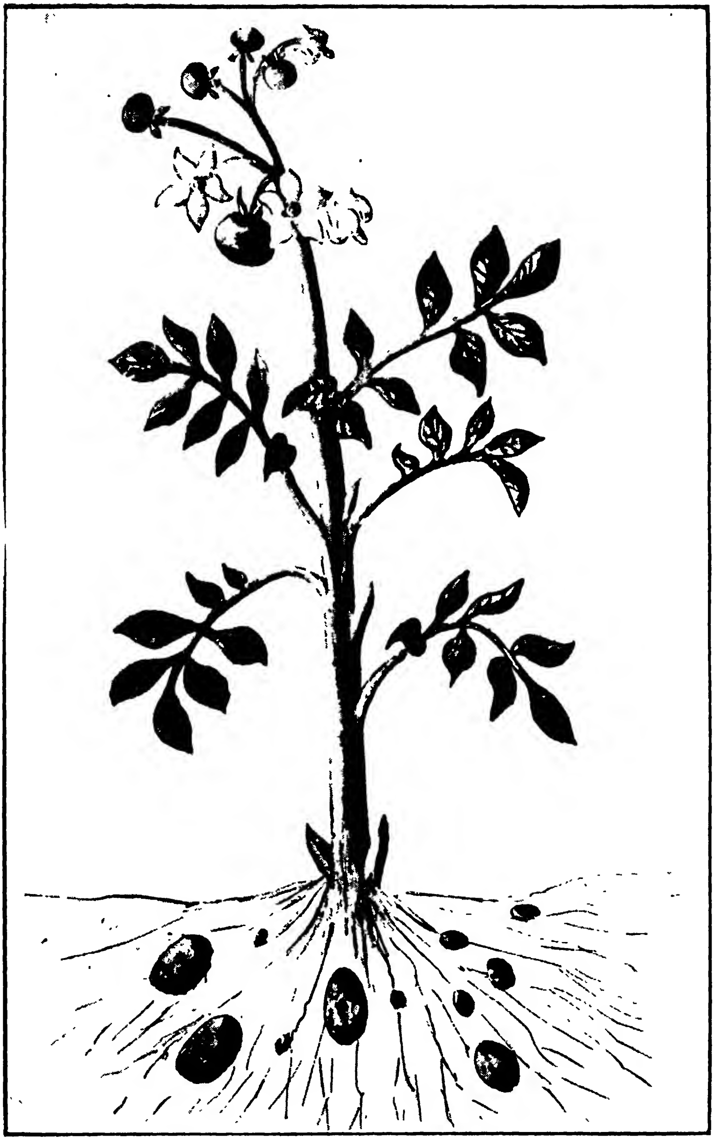

Fig. 4.—An Early Drawing of the Potato.

Fig. 5.—The Wild Cabbage

Fig. 6.—A species nearly related to the Original Pea.

bloom, light dry airs are desirable to waft the pollen from the anthers of one plant to the stigmatic surface of another. It has now been established that, whatever may be the case with other grasses, wheat, barley, and oats are regularly self-pollinated. The early attempts at the cross-pollination of wheat were doomed to failure simply because they were carried out when the flower opened. Artificial cross-pollination is only successful when self-fertilisation is first prevented by the complete removal of the male organs at a sufficiently early stage. This being done the pollen from another plant may be conveyed to the stigmatic surface of the specimen which has been treated. It has been fairly well proved that once the female organs have been fertilised there is no further risk of wind-borne pollen which may happen to settle on the stigmatic surface taking any effect. Although, as has been pointed out, simple selection alone is of great value in the improvement of plants, yet we owe the wonderful modern cereals chiefly to artificial cross-breeding. Such important matters as the hardening of the grain, the increase of the store of food reserve (now far larger than that which is actually needed for the use of the embryo), and the production of new varieties able to withstand special climatic conditions, are all the results of artificial cross-fertilisation. An immense amount of work has been carried out by various public institutions and private firms to improve all the cereals, so that within the last twenty years, wheat, barley and oats have changed to such an extent that the farmer of the last generation would hardly recognise them at all. The British agriculturist is proverbially slow and he is only just beginning to wake up to the fact that many of the new varieties of cereals which have been introduced will give a yield of grain *double*, or even more than double, the present average per acre. That it pays to buy the seeds even at an enhanced price goes without saying.

THE TURNIP.

Certainly one of the most important events in British agriculture was the introduction of the Turnip. Although the plant was then known in gardens, it does not seem to have been planted as a field crop in Britain until the end of the 17th century. It is almost certain, however, that the cultivation of the turnip was practised from very early times in temperate Asia where it still occurs in a wild state. Probably the plant is also indigenous to Europe, and in some quarters it has even been regarded as a native of the British Islands. In this connection, it should be borne in mind that the turnip is one of

those plants which are very liable to escape from field and garden, and to start an existence by the sides of fields and in any odd corners. The varieties of the turnip are a vast company represented by the swedes, the kohl-rabis, and others, with which one is so familiar. It is likely that all these originated from three species, *Brassica napus*, *Br. rapa*, and *Br. oleracea*; the last-named is, of course, the cabbage, a plant with such a remarkable history that it is worthy of special treatment. The improvement of the various forms of turnip have been chiefly in the direction of increasing the weight of the root. It is not uncommon to find Swedes weighing as much as 25 or 30 pounds. This is very remarkable when one remembers that the wild types of turnip have roots little thicker than a pencil.

The Beetroot.

The story of the beetroot is almost as remarkable. The home of this plant, *Beta vulgaris*, is principally in Southern Europe where the species grows wild in sandy soil, especially near to the sea. A closely allied form grows wild on the coasts of Britain; this is called *Beta maritima* and it is probably a distinct species, although some authorities have held the plant to be the ancestor of the cultivated beetroot. The cultivation of the beetroot does not appear to be very ancient, and probably does not date from more than three or four centuries before the Christian era. From the earliest times it appears that the red and white rooted varieties were known, and, although these are sometimes described as distinct species, it is probable that both are of the same origin. Like the turnip, the beetroot has shown itself to be a plant which is easily improved by selection. From the farmer's point of view, the most serviceable is the mangel wurzel, which is considered to be a coarse form of the beet. During the last few years quite astonishing results have been secured with some of the new varieties of mangel wurzels. (Figs. 1 and 2.) An average crop of this root would be about twenty tons per acre; modern kinds will yield a hundred tons or even more per acre. Some of these new varieties, the seeds of which may be comparatively costly, are really worth the money, on account of the huge additional yield. The red rooted form of beetroot is, of course, a common garden plant. The question of the growing of sugar beet is one which should receive special attention in this country. Several attempts have been made to establish this industry but as yet there is nothing very encouraging to record. One may take this opportunity of again placing on record the fact that in many parts of the United Kingdom beetroot can be

grown quite as well on the Continent, and in some cases with even a higher percentage of sugar. One result of the present disastrous war will be that the question of growing a home supply of beet sugar will be considered more thoroughly than ever before, for there is likely to be a shortage of the sugar supply from the Continent.

The writer desires to express his indebtedness to Messrs. Sutton and Sons for the illustrations of the Globe Mangel, and that showing the development of the Carrot.

THE CARROT.

A few remarks on the history of the carrot (*Daucus carota*) may be of interest. As is well known, this plant, in its uncultivated form, is an exceedingly common weed, but there is little resemblance between the wildling and the cultivated form, save perhaps in the foliage of the plant and the characteristic smell of the root. The carrot is distributed as a wild subject as far towards the east as India, and the plant has without doubt been cultivated for a long time. The modern carrot shows an astonishing advance upon the varieties of even a few years ago, as may be seen from the accompanying illustration. (Fig. 3.)

THE POTATO.

Although the potato (*Solanum tuberosum*), so far as Europe is concerned, is of comparatively recent introduction, there seems no doubt that the plant has been cultivated for a long time in America. Long before the Spaniards reached the New World, the potato was widely grown by races living on the slopes of the Andes. On this account, it is very difficult to determine the locality in which this useful plant originated, although examples very much like wild forms of the potato have been discovered in Chili and Peru. There is little doubt that the potato was first of all brought to Europe by the Spaniards at the beginning of the 16th century, and that the cultivation of the plant gradually spread over the Continent, though specimens seem to have been grown simply as curiosities. A little later on, Sir John Hawkins and Sir Francis Drake introduced the potato into England, but it was not until long after this that anyone had the least idea that the plant was of importance as a food. Even so recently as in 1719, the Complete Gardener of Loudon and Wise does not mention the potato at all. Finally, the idea seems to have arisen that the tubers, which in these early times were very small, might be of service for the feeding of animals. A few bad

harvests during the 17th century appear to have suggested the idea that the potato might be good for human food, and thenceforward the culture of the plant advanced by leaps and bounds. Our illustration reproduces an early drawing of the potato. (Fig. 4.) One thing which appealed to all nations was the large amount of weight a crop of potatoes would produce. Humboldt calculated that a plot of ground which would produce 30 lbs. of wheat would be capable of bearing 1,000 lbs. of potatoes. It must, however, be borne in mind that potatoes are very inferior in food value to wheat. Nowadays the potato is one of our most highly cultivated plants. The number of varieties is enormous, and whilst some of these may not be of great value, others are vast improvements on anything ever introduced before. Even more important than the question of cropping is that of disease resistance, and it is for this quality that some of the modern varieties have become noted. Thus a single potato of a really first class variety was sold for as much as £50, and the purchaser considered that he had his money's worth!

THE CABBAGE.

A very remarkable history is that of the cabbage (*Brassica oleracea*), and its many forms and varieties. As a wildling (Fig 5) the plant is still to be found in many localities on the southern coast of England, although few would recognise this weedy-looking plant as the ancestor of our well-known vegetable. The wild cabbage is also very abundant in many parts of Europe, and it almost always grows near the sea. That the cabbage has been cultivated for a very long while is certain, and in even the time of Pliny (70 A.D.) six varieties were known. Of course, nowadays, the number of forms of cabbage is simply legion, and includes such extreme examples as the Brussels sprouts and the broccoli. The cause of this wonderful variation lies in the strongly vegetative character of the cabbage; this feature increases greatly under cultivation, and causes remarkable developments in all parts of the plant. Thus it may affect the stem, which will become greatly swollen and turnip-like, as in the case of the kohl rabi, or may rise to the height of eight or ten feet, as is seen in the Jersey cabbage. The vegetative energy may, however, be directed towards the formation of huge quantities of buds, and then we have the Brussels sprouts. Again, it may be concentrated on one huge bud which rises upwards in the form of a solid mass of closely packed leaves, as is seen in the typical cabbage. Perhaps the most advanced type of all is that of the cauliflower;

here the energy has all tended towards the development of an enormous mass of flower buds. For the plant specialist, therefore, such a highly variable subject as the cabbage has proved to be like " clay in the hands of the potter." The leading varieties which have been mentioned stand at the head of long lists of somewhat similar kinds, all of more or less value to the farmer and the gardener.

PEAS AND BEANS.

It has been a common practice to divide the garden pea (*Pisum sativum*) and the field pea (*Pisum arvense*) into two distinct species. It is now considered likely that the garden pea is merely a variety of the field pea. However this may be, the wild ancestors of the peas which we now cultivate originated in Southern Europe, and possibly also occurred in the East. (Fig. 6.) The cultivation of the pea is extremely ancient. For instance, the garden pea has been found amongst the remains in the lake dwellings of Switzerland, and the Savoy. But of these, the examples are smaller than the modern peas ; there is, however, no question as to their identity. Curiously the pea does not seem to have appealed to British farmers and gardeners until comparatively recent times. There is no very clear record that it was cultivated in this country even in the time of Queen Elizabeth. According to an old chronicler, the first peas ever eaten in this country were brought over from Holland, when they were only considered to be " fit dainties for ladies, they came so far." Where the wild Broad Bean (*Faba vulgaris*) came from is a matter which is not definitely known. Probably the plant originated in the East. Certainly its cultivation is very ancient for it was known to the Egyptians, the Greeks and the Romans ; the last are said to have introduced the broad bean into Britain. During the last few generations, the plant has been immensely improved, and a very large number of varieties have been introduced. The French Bean (*Phaseolus vulgaris*) and the Scarlet Runner (*Phaseolus coccineus*) do not seem to have been cultivated from very early times. Yet there is no certain knowledge available as to the locality where these plants originated. Kidney beans have been discovered in Peruvian tombs near Lima, though it is possible that these may have been brought over from Europe by the Spaniards. It is significant, however, that all the other fruits and seeds found in the tombs are of exclusively American origin. Probably, therefore, the original home of the plants is to be found somewhere in South America.

RECENT CIDER EXHIBITS.

By F. J. Lloyd, F.C.S., F.I.C.

It is well known to scientific men that, in the fermentation which takes place during the conversion of apple juice into cider, the amount of alcohol *by weight* produced represents very closely one half the amount of sugar which has been fermented. The other half has been converted mainly into carbonic acid, which is the gas given off from a fermenting cider vat.

If, then, one has the analysis of a sample of cider showing the amount of alcohol *by weight* present, and also the amount of solids, it is possible from these figures to calculate what was the original composition of the apple juice from which that cider was made.

For example, a sample of cider is found to contain 4·80 per cent. of alcohol *by weight* and 4·44 per cent. of solids.

$4{\cdot}80 \times 2$	=	9·60
Add solids	=	4·44
Original solids in juice	=	14·04

The analyses of the cider exhibited at the Society's shows, gave the amount of alcohol present *by volume*, so that the foregoing calculation cannot be made from the published figures. But for ordinary purposes a fairly accurate result can be obtained, if one-fifth of the alcohol *by volume* is deducted, as this leaves approximately the percentage of alcohol *by weight*. Thus, in the sample previously mentioned, the alcohol *by volume* was given as 6·00 per cent., so that if we deduct one-fifth, *i.e.*, 1·20, we have left 4·80, which in this case is the exact amount of alcohol *by weight*.

Among the samples of cider shown at Swansea were one or two the analyses of which led me to think they were not genuine, *i.e.*, made from pure apple juice. Some appeared to me to be diluted, and it was not the first time this thought had passed through my mind when making the analyses of exhibited ciders.

To throw some light upon this point, and for the purpose of determining what is the general quality of the apple juice converted into cider in this country, the original solids present in the juice of all the exhibits for the past five years have been calculated. The figures so obtained are too numerous to quote individually, but they are summarised in the following table :—

TABLE SHOWING THE PERCENTAGE OF SOLIDS PRESENT IN THE ORIGINAL APPLE JUICE FROM WHICH THE CIDERS EXHIBITED AT THE SOCIETY'S SHOWS FROM 1910 TO 1914 WERE MADE.

	1910	1911	1912	1913	1914
Number of Exhibits of which the original juice contained 9 % solids or over ..	—	3	—	1*	1
Ditto 10% ditto	—	3	—	1	2
Ditto 11% ditto	3	5	3	5	4
Ditto 12% ditto	6	10	6	7	12
Ditto 13% ditto	15	11	5	12	22
Ditto 14% ditto	4	22	7	14	13
Ditto 15% ditto	4	5	7	2	5
Ditto 16% ditto	4	5	18	6	4
Ditto 17% ditto	—	—	4	1	—
Ditto 18% ditto	—	—	1	1	—
Ditto 19% ditto	—	—	0	—	—
Ditto 20% ditto	—	—	2	—	—
Total number of Exhibits	36	64	53	50	63

* Under.

There were in the five years 266 ciders exhibited; a sufficient number to allow of fairly accurate general conclusions being drawn from the results obtained.

GENUINE CIDER.

It would seem highly probable that the eleven samples showing under 11 per cent. of solids were not in the strict sense genuine, but were made from diluted apple juice. There is no harm in making such "Small Cider;" in fact, the writer has always maintained that a great field was open for enterprise in the manufacture of such a beverage. It would be acceptable to thousands of pedestrians and cyclists who find genuine cider too heavy a drink, and, as at present made, too sweet, though the malic acid, natural to cider, is probably more quenching to the thirst than the acid present in any other liquid known. Malic acid has, moreover, a physiological action which makes it preferable to, and less injurious than, any other acid.

The Society's exhibits, however, are at present restricted to cider proper, and it would seem desirable to disqualify all samples made from an apple juice containing less than 11 per cent. of original solids, as it is not profitable to grow apples for cider-making which do not yield a juice of this quality. As a matter of fact, very few

varieties ever do yield so poor a juice. Of the 400 analyses of apples which I made at Butleigh, when carrying out my investigations on Cider-making, only five gave a juice containing less than 11 per cent. of solids, and only twenty-four other samples gave a juice containing under 12 per cent. of solids.

Moreover, cider is scarcely ever made from one variety of apple alone, so that it may be safely assumed that juice showing less than 11 per cent. of solids has been watered. Therefore exhibits made from such juice should be disqualified.

At the other end of the scale there were four exhibits made from juice which contained over 18 per cent. of solids. If not fortified, these were most exceptional juices. It is possible to make cider of this quality, but only in very small quantities, and certainly not on a commercial scale. Hence, if on the one hand it is desirable to exclude from competition samples that have been watered, it is equally desirable to disqualify samples which are either abnormal or have been fortified.

As a further proof of the exceptional nature of both these very poor and very rich juices, it is only necessary to compare them with the average per cent. of solids present in the original apple juices during each of the past five years, as shown in the following table:—

Year	1910	1911	1912	1913	1914
Solids % in original juice. Average	13·8	14·0	15·1	13·7	13·7

ALCOHOL.

The natural preservative of cider, as of every other fermented drink, is the alcohol produced by the fermentation, augmented by the carbonic acid gas produced at the same time. Cider which does not contain a fair proportion of alcohol will not keep, and is liable to many so called "diseases" or sources of deterioration. Cider which has gone off, if sold, damages the reputation of cider as a beverage, and, if not sold, is a dead loss to the producer. In either case the maker loses, either directly or prospectively. For this reason I advised the Society to have a class for ciders containing over 4 per cent. of alcohol *by volume*, which is only equal to 3·2 per cent. *by weight*, but after some years this was objected to, and the condition was altered. The objection, so far as I understood it, was that makers could not ensure obtaining 4 per cent. alcohol *by volume*. Is that so? If we examine the analyses of the cider

exhibits at the Society's shows for the last five years we find the following facts :—

In	1910	1911	1912	1913	1914
No. of Exhibits	36	64	53	50	63
No. containing at least 4 % alcohol by volume	17	28	43	33	31
Percentage of exhibits containing 4% alcohol by volume	47	44	81	66	49
Solids in juice	13·8	14·0	15·1	13·7	13·7

How can we account for the fact that in 1912 no less than 81 per cent. of the exhibits contained 4 per cent. or over of alcohol by volume, while in 1911 only 44 per cent. had this amount. It cannot be said that it is due to the juice from which the exhibits of 1912 were made having more solids, for we find that the juice of the exhibits in 1911 was richer than that of 1913, and yet with the poorer juice of 1913 there were 50 per cent. more properly fermented juices than in 1911. One is forced to the conclusion that, in spite of the progress which is being made in the application of science to cider-making, the makers have not yet learnt to control fermentation, but leave it too much to the chance of season.

When the alcohol standard was done away with, a new standard of specific gravity took its place, the exhibits being divided into two classes, those having a specific gravity of not more than 1·015, and those with a higher gravity. It was hoped in this way to give makers an opportunity of checking their exhibits and ensuring their being placed in the right class, which was difficult for them when the 4 per cent. standard of alcohol was adopted.

What was the effect of this change? During the past five years there have been 266 ciders exhibited, and of these only 60 came within the lower gravity of 1·015. Six of these were undoubtedly made from watered juice and must be discarded, so that really only 54 samples legitimately complied with the regulation. If we examine these 54 samples more closely we find the following facts :—

Year.	No. of Sample.	Alcohol by volume.	Solids.
1910	10	5·42	4·36
1911	9	5·53	4·93
1912	6	6·29	4·99
1913	14	5·35	4·63
1914	15	5·44	4·62

It will be seen that the actual effect of introducing the specific gravity standard was to raise the alcohol standard from 4 to well over 5 per cent. of alcohol by volume. Thus instead of promoting generally the production of a drier cider, which was the original intention when a standard was introduced, the ultimate result has been to promote the production of a small proportion of dry ciders. But it would scarcely seem to the advantage of the industry, as a whole, for only one-fifth of the exhibits to fall into one class and four-fifths into the second class, and that the variety which it is not desirable to promote.

I take it that the object of the Society was to try and separate the really "dry" ciders from the "sweet," so that they might be shown in separate classes. The only accurate way of doing this is to classify the ciders according to the percentage of solids they

TABLE SHOWING THE AVERAGE SPECIFIC GRAVITY OF THE CIDERS EXHIBITED DURING THE PAST SIX YEARS, CLASSIFIED ACCORDING TO THE SOLIDS THEY CONTAIN.

SOLIDS PRESENT	NO. OF SAMPLES.	AVERAGE SPECIFIC GRAVITY
Between 2—3%	4	1·0040
3—4%	8	1·0085
4—5%	33	1·0126
5—6%	38	1·0152
6—7%	44	1·0207
7—8%	62	1·0252
8—9%	78	1·0287
9—10%	31	1·0325
10—11%	13	1·0370
Over 11%	10	

contain. It is rather difficult for an exhibitor to determine these. It can be done by boiling a definite volume of cider for about fifteen minutes, cooling, making up to the original bulk and taking the gravity. The alcohol is got rid of by boiling, and the specific gravity of the residue is due to unfermented solids. The separation of a "dry" from a "sweet" cider by any other method is unsatisfactory.

The specific gravity of a cider is a very uncertain guide, though probably the best that can be adopted at any show. That it leaves much to be desired may be gathered from the fact that during the last five years there were exhibited 27 ciders containing over 5 per cent. alcohol by volume, yet with a specific

gravity of over 1·015. These samples averaged 5·5 per cent. alcohol by volume, and 7·84 of solids, which solids raised the gravity above the standard of 1·015. How can any judge compare ciders of this description with those of usual quality containing only a low percentage of alcohol and an average amount of solids? What change, if any, is desirable, and what would be the effect of such a change? To answer this question, all the samples of cider exhibited for the last six years at the Bath and West Society's Shows have been classified according to the percentage of solids they contained, and the average of the specific gravities they possessed has been calculated. The results are shown on the preceeding page.

It seems to me that two methods of improvement are feasible. The one is to divide the Cider exhibits into three classes: (*a*) dry, with specific gravities of 1·015 or under; (*b*) medium sweet, with specific gravities over 1·015 and up to 1·025; (*c*) sweet, with specific gravities over 1·025.

If this is not acceptable then the other alternative, with a view to dividing the exhibits into more equal sections, would appear to be to raise the standard to 1·020 for the dryer ciders.

The suggestions which a study of the Cider Exhibits leads me to make may then be summarised as follows:—

(1) That ciders which have been made from juice containing less than 11 per cent. or more than 17 per cent. of solids, should be disqualified.

(2) That the standard of gravity to distinguish "dry" from "sweet" cider should remain at 1·015, but that the large number of exhibits having a gravity over 1·015 should be divided into two classes.

(3) That cider makers should endeavour to exercise more scientific control over the fermentation of the apple juice and not allow themselves to be so much at the mercy of the seasons.

VIII.—THE SOCIETY'S EXHIBITION AT SWANSEA.

By Thos. F. Plowman, Secretary and Editor.

The Society's 1914 Exhibition at Swansea was opened on Thursday, May 28, and closed on Whit Tuesday, June 2.

The Show was inaugurated by the Mayor of Swansea (Alderman T. T. Corker) who attended in state, accompanied by the Members of his Corporation, the Parliamentary Representative of the

Borough (Sir Alf. Mond, Bart., M.P.), and the Local Executive Committee. They were received by the President (Sir J. T. D. Llewelyn, Bart.), and the members of the Council of the Society.

In welcoming the Mayor and Corporation, the President said that this was the third time the show had been held at Swansea, and those who could carry their minds back to the early days of agricultural shows would be aware of the great advance that had been made in agriculture in our country, and especially in the Principality of Wales. It was one of the largest, if not the largest, of the individual industries in the country, and one in which all were interested, because it embraced the science and practice of providing food for the people. The advance of the industry could be measured partly by the quantity and partly by the quality of the exhibits they would see that day, and also to a very considerable extent by the widespread interest the Show evoked. In that society they had the great advantage of a most experienced secretary, to whose efforts they owed more than he could say. At each of the two previous shows the Society had held at Swansea there had been a very large and satisfactory attendance, and if they were this year blessed with fine weather he trusted that might be the case again. He had always held that horticulture was own sister to agriculture, and he was one of those who thought that intensive horticulture, as shown by nursery gardens, was of immense importance to the community as a means of provision of better and larger quantities of vegetables, so necessary for the health of the people. South Wales was not a fruit-growing country, not being blessed with so much sunshine as the county of Kent. But they could grow vegetables, and he claimed that agriculture and horticulture were so closely allied that they must encourage both.

The Society's Secretary then read the resolution of the Council of the Society inviting the Mayor to inaugurate the Show.

The Mayor said he had exceeding pleasure in inaugurating the exhibition. He felt that it was an honour to Swansea to have that huge show there, and that it would do the town considerable good. They were doubly proud, owing to the fact that Sir John Llewelyn was President of the Society. The whole town felt glad that the man they had just honoured with the freedom of the borough should be the Society's President for the year, and the Society itself might be congratulated that Sir John had accepted the office. The show was first held at Swansea in 1892, when the late Mr. Mason, who was then Mayor, took great interest in it, and he (the Mayor) was pleased to say that Mr. Mason's son had followed in the footsteps of his father, being an active member of the local committee as well

as of the Society's Council. Swansea held the record next to Bristol for attendances at the show, and this year, if the splendid weather continued, there were prospects of still greater success, for the entries largely exceeded those of the last show at Swansea.

Sir John Llewelyn having thanked the Mayor and Corporation and the Local Committee, whom, he said, had worked extremely hard to make the show a success, Mr. F. F. Mason, Chairman of the Local Committee, responded on their behalf.

Plan.

A plan showing the situation and arrangement of the Yard faces this report.

Entries.

The following is a comparative statement of the entries in the Stock and Produce Classes in 1892, 1904 and 1914, in each of which year the Show was held at Swansea.

	Swansea, 1892.		Swansea, 1904.		Swansea, 1914.	
Horses :—						
Agricultural	31		67		46	
Hunters, Hacks, Ponies, Harness and Jumping	70		216		263	
	—	101	—	283	—	309
Cattle :—						
Devons	25		19		33	
South Devons	0		18		26	
Shorthorns	47		59		48	
Herefords	37		69		65	
Sussex	20		10		6	
Jersey	118		100		91	
Guernsey	25		40		50	
Kerry and Dexter	0		47		31	
Red Polled	0		15		0	
Aberdeen-Angus	0		24		22	
Welsh Black	24		32		25	
Dairy	21		38		37	
Any Breed	0		4		0	
	—	317	—	475	—	434
Sheep		249		131		169
Pigs		113		158		87
Poultry		422		335		489
Farm Produce :—						
Cheese	72		51		38	
Cream Cheese, Butter and Cream	92		104		86	
Cider	0		52		63	
	—	164	—	207	—	187
		1,366		1,589		1,675

A list of the awards, names of the Judges, etc., will be found on pages *i* to *lxxxii* of the Appendix to this volume.

Prizes.

The money prizes in 1914 were contributed as follows :—

	£	s.	d.
Bath and West and Southern Counties Society ..	2,847	5	0
Swansea Local Committee	301	11	6
Shire Horse Society (or Medal)	15	0	0
F. F. Mason, Esq.	2	2	0
Devon Cattle Breeders' Society	10	0	0
Shorthorn Society	20	0	0
Dairy Shorthorn (Coates's Herd Book) Association ..	10	0	0
Hereford Herd Book Society	20	0	0
Welsh Black Cattle Society	20	0	0
English Aberdeen-Angus Cattle Association ..	10	0	0
English Jersey Cattle Society (or Medal)	20	0	0
English Guernsey Cattle Society	10	0	0
English Kerry and Dexter Cattle Society	15	0	0
Kent or Romney Marsh Sheep Breeders' Association	17	0	0
Southdown Sheep Society	17	0	0
Hampshire Down Sheep Breeders' Association ..	10	0	0
Oxford Down Sheep Breeders' Association ..	10	0	0
Dorset Horn Sheep Breeders' Association	15	0	0
Dorset Down Sheep Breeders' Association	15	0	0
Exmoor Horn Sheep Breeders' Society	10	0	0
British Berkshire Society	5	0	0
Large Black Pig Society	12	0	0
Glamorgan County Council	35	10	0
	£3,447	8	6

Gold, Silver and Bronze Medals were also given by the Society, and Medals or Plate by the Shire Horse Society; Sir J. T. D. Llewelyn, Bart.; David Davies, Esq., M.P.; the Hunters Improvement and National Light Horse Breeding Society; the Hackney Horse Society; the National Pony Society; the Swansea Local Committee; Chas. A. Hanson, Esq.; the Sussex Herd Book Society; the Aberdeen Angus Cattle Society; the English Aberdeen Angus Cattle Association; the English Jersey Cattle Society; B. de Bertodano, Esq., the English Kerry and Dexter Cattle Society; the Southdown Sheep Society, and the Poultry Club.

Implements.

The following is a comparative statement of the number of feet run of shedding provided for implements, machinery, etc., and of

the number of square feet of open space occupied by exhibits unsuitable for shedding :—

		Swansea, 1892.	Swansea, 1904.	Swansea, 1914.
Machinery in Motion ..	.. feet run	812	1,358	1,512
Agricultural Implements ..	.. ,,	3,400	3,085	2,675
Other Exhibits not strictly Agricultural ,, ...	.. ,,	980	950	340
Seeds, Cattle Foods, Artificial Manures, &c.	.. ,,	736	847	1,111
		5,928	6,240	5,638
Open space for Farm and Horticultural Buildings, &c. ..	..square feet	10,917	20,644	27,206
		16,125	26,884	32,844

Miscellaneous Departments.

Nature Study, Handicrafts and Forestry exhibitions (particulars of which will be found on pages 88 to 91), were again noteworthy features of the Show, and excited much interest.

Near the Forestry Gallery, demonstrations of Tree Pruning and Grafting were given each morning by Mr. J. Ettle, F.R.H.S.

A fully equipped Working Dairy, in which the Buttermaking Competitions were held, formed, as usual, a prominent feature of the Show. Here various dairy implements and appliances, including power and hand separators were shown at work, and the best methods of making butter and clotted cream were practically demonstrated.

There were also Shoeing, Milking, Timbering and Splicing Competitions, the following being a comparative statement of the entries —

	Swansea, 1892.	Swansea, 1904.	Swansea, 1914.
Butter-Making	175	135	212
Shoeing	48	117	102
Milking	0	12	17
Timbering and Splicing	0	37	24
	223	301	355

Musical performances were given daily by the Band of the Royal Marine Artillery, under the conductorship of Lieut. B. S. Green, M.V.O., Mus.Doc.

The usual Sunday Service, at which there was a large attendance

of herdsmen and others engaged in the Yard, was held in the Working Dairy. The sermon was preached by the Vicar of Swansea, the Rev. the Hon. W. Talbot Rice, M.A., and the service was conducted by the Society's Chaplain (Rev. A. T. Boscawen) assisted by other clergy.

ATTENDANCE.

As will be seen from the following statements, the attendance at the Show was extremely satisfactory, exceeding that at either of the two previous meetings at Swansea, whilst the amount paid for admission was also larger than on those occasions.

NUMBER OF ADMISSIONS.			ADMISSION RECEIPTS.		
Swansea, 1892.	Swansea, 1904.	Swansea, 1914.	Swansea, 1892.	Swansea, 1904.	Swansea. 1914.
73,107	78,827	85,762	£5,164 0 9	£5,591 11 9	£5,977 1 0

IX.—THE MILK-TEST CLASSES AT SWANSEA.

By Dr. J. A. Voelcker, M.A., F.I.C., Consulting Chemist to the Society.

Seventeen cows appeared in the Milk-Test Classes at Swansea, as against fourteen the previous year at Truro. One cow, however, was withdrawn from the competition after the first milking, so that sixteen only are reckoned.

The sixteen cows comprised ten Jerseys, one Guernsey, one South Devon, one Shorthorn, two Lincoln Reds, and one cross-bred.

The light-weight class (Class 128) was made up entirely of Jerseys, the other two Jerseys finding their place among the heavy-weights (Class 129). The cows were all milked out dry on the evening of Thursday, May 28th, and the morning and evening milkings of Friday, May 29th, were taken for the test.

In Class 128 only one cow failed to reach the standard, the milk being on each occasion low in total solids, though just reaching the requirements in fat.

The 1st Prize was easily won by Mr. Smith-Barry's "Musette," independently of any points for lactation, while Miss Enderby's "Favour's Fortune" occupied the second place, and Lady Wernher's "Carlsbad" the third. The points gained were rather lower, as a whole, than at Truro, in 1913.

None of the cows entered in this class had appeared previously in the Society's competitions.

In Class 129 three cows, viz., one South Devon, one Shorthorn, and one Lincoln Red, failed to reach the standard. Deficiency in fat, as also in total solids, was in each instance the cause. Fat figures of 1·95 per cent. and 2 per cent. are clearly such as should not be tolerated, especially when it is noticed that, but for this, the cows in question would have gained the second and third prizes respectively.

The highest yield was given by the Lincoln Red "Burton Rosary," but, here again, the standard of fat and total solids was not reached. Mr. J. Evens, however, received his consolation in getting the 1st Prize with his other Lincoln Red, "Burton Bella," which at Truro had been placed second to Mrs. Bainbridge's Guernsey cow, "Cherry," and now turned the tables upon her. The 3rd Prize was won by Mr. Smith-Barry's Jersey cow, "Flower Girl."

It is worthy of mention that Mr. Smith-Barry's Jersey cow, "Musette," first of its class in the Milk-Test. was also 1st Prize winner in the Butter-Test.

MILK-TEST CLASSES.

No. in Catalogue.	Owner and Cow.	Breed.	Age.	No. of Days in Milk.	Quantity of Milk.					
					Morning.		Evening.		Total.	
	CLASS 128. Cows under 900 lbs. live weight.		Years		lbs.	oz.	lbs.	oz.	lbs.	oz
497	Mr. J. H. Smith-Barry's "Musette" ..	Jersey	$4\frac{3}{4}$	73	24	7	25	8	49	15
342	Miss Enderby's "Favour's Fortune" ..	"	6	51	24	0	23	10	47	10
336	Lady Wernher's "Carlsbad"	"	$6\frac{1}{2}$	56	21	4	22	4	43	8
495	Mr. J. H. Smith-Barry's "Foxglove" ..	"	$3\frac{3}{4}$	134	16	2	19	2	35	4
337	Lady Wernher's "May Queen 2nd" ..	"	5	42	17	4	17	4	34	8
343	Mrs. Evelyn's "Sweet Daisy"	"	$6\frac{1}{2}$	133	15	10	16	0	31	10
498	Mr. G. W. Stark's "Rewhar"	"	4	131	16	0	15	0	31	0
493	Mr. A. Miller-Hallett's "Flying Fox's Electra"	"	2	131	21	10	17	12	39	6
	CLASS 129. Cows 900 lbs. live weight or over.									
501	Mr. J. Evens' "Burton Bella"	Lincoln Red	5	67	27	8	26	10	54	2
500	Mrs. Bainbridge's "Cherry"	Guernsey	10	53	24	0	24	6	48	6
496	Mr. J. H. Smith-Barry's "Flower Girl"	Jersey	8	133	17	12	19	4	37	0
499	Mr. G. W. Stark's "Violet"	Cross	$5\frac{1}{2}$	147	16	10	16	4	32	14
347	Lord Rothschild's "Coulisse 15th" ..	Jersey	6	123	16	2	17	0	33	2
141	Messrs. W. & H. Whitley's "Sherford Buttercup"	S. Devon	10	54	24	8	28	14	53	6
178	Mr. F. H. S. Perkins' "Hadnock Ringlet 28th"	Shorthorn	$3\frac{3}{4}$	20	24	4	28	8	52	12
502	Mr. J. Evens' "Burton Rosary" ..	Lincoln Red	7	28	28	12	28	8	57	4

MILK-TEST CLASSES.

Quality of Milk.				No. of Points for Milk.	No. of Points for Lactation.	Total No. of Points.	Awards.
Morning.		Evening.					
Fat.	Solids.	Fat.	Solids.				
per cent.	per cent.	per cent.	per cent.				
5.20	14.56	5.15	14.50	49.93	3.30	53.23	First Prize.
4.15	13.55	4.35	13.58	47.62	1.10	48.72	Second Prize.
3.90	12.77	4.55	13.45	43.50	1.60	45.10	Third Prize.
3.50	12.75	5.00	13.88	35.25	9.40	44.65	Reserve Number.
4.30	13.20	4.65	13.55	34.50	.20	34.70	
5 20	14.85	5.70	14.93	31.62	9.30	40.92	
4.75	14.63	5.45	14.94	31.00	9.10	40.10	
3.10	11.43	3.40	11.85	39.37	9.10	48.47	Below standard.
3.35	12.15	3.50	12.28	54.12	2.70	56.82	First Prize.
3.90	12.83	4.85	13.43	48.37	1.80	49.67	Second Prize.
5.00	14.05	5.00	13.75	37.00	9.30	46.30	Third Prize.
3.05	12.65	3.95	13.00	32.87	10.70	43.57	Reserve Number.
6.30	16.13	6.75	16.37	33.12	8.30	41.42	
1.95	10.57	4.40	13.02	53.37	1.40	54.77	Below standard.
2.00	11.35	2.50	11.74	52.75	nil	52.75	Below standard.
2.60	11.43	3.70	12.71	57.25	nil	57.25	Below standard

X.—THE BUTTER-TEST CLASSES AT THE SWANSEA EXHIBITION.

By A. F. Somerville, Judge.

Ten cows, out of an entry of twelve, competed for the English Jersey Cattle Society's Gold, Silver and Bronze Medals. The animals were stripped on Thursday, May 28th, at 6 p.m., and milked at 6 a.m. and 6 p.m. on Friday, May 29th. Separation took place after each milking, and churning was carried out on Saturday, May 30th.

The prizes were awarded as follows :—

	Days in Milk.	Weight of Butter.	Points.
GOLD MEDAL.			
Mr. J. H. Smith-Barry's "Musette"	73	2lbs. 15ozs.	50.30
SILVER MEDAL.			
Lord Rothschild's "Coulisse 15th"	123	2lbs. 7½ozs.	47.80
BRONZE MEDAL.			
Mr. J. H. Smith-Barry's "Flower Girl"	133	2lbs. 0ozs.	41.30

Certificates of Merit were awarded to Mrs. Evelyn's "Sweet Daisy," Miss Enderby's "Favour's Fortune," and Mr. Smith-Barry's "Foxglove." As one cow was abnormally deficient in butter-fat, due probably to some temporary cause, it is excluded in taking an average for the class.

The average of the remaining nine animals tested is as follows :—

No. of Cows.	Days in Milk.	Milk.		Butter.		Ratio.	Points.
		lbs.	ozs.	lbs.	ozs.		
9	98	37	7⅜	2	⅓	18.88	38.14

Though even milkings would probably be an advantage if they could be arranged at home as well as at a Show, there are obvious difficulties in the way, and experience shows that no real advantage is gained by altering the periods in the Show yard, where the conditions are abnormal and the results obtained by a Butter Test are, in many cases, not a real test of an animal's capability under ordinary conditions. My thanks are due to Mr. Clark the Steward of Butter Tests and to the ladies who assisted at the Trials.

The appended table gives particulars of the Test :—

No. in Catalogue.	Exhibitor.	Name of Cow.	Date of Birth.	Date of Last Calf	No. of Days in Milk.	Milk Yield. Total.		Butter Yield.		Ratio, viz., lb. Milk to lb. Butter.	No of Points for Butter.	No of Points for Lactation.	Total Number of Points.	Awards.
						lb.	oz.	lb.	oz.					
335	M. W. Stratford ..	Pompadour ..	.. Oct. 1, 1910	Jan. 9, 1914	140	24	8	1	3¼	20.36	19.25	10.00	29 25	
336	Lady Wernher ..	Carlsbad ..	.. Dec. 4. 1907	April 3, 1914	56	43	8	2	0¾	21.25	32.75	1.60	34.35	
337	Lady Wernher ..	May Queen 2nd	.. April 10, 1909	April 17, 1914	42	34	8	1	11	20.44	27.00	.20	27.20	
342	Miss Enderby ..	Favour's Fortune	.. May 8, 1903	April 8, 1914	51	47	10	2	5¼	20.45	37.25	1.10	38.35	Certificate of Merit
343	Mrs. Evelyn ..	Sweet Daisy ..	.. Oct 23, 1907	Jan. 16, 1914	133	31	10	1	14	16.86	30.00	9.30	39.30	Certificate of Merit
347	Lord Rothschild ..	Couilsse 15th	.. April 25, 1908	Jan. 26, 1914	123	33	2	2	7¾	13.41	39.50	8.30	47.80	E.J.C.S. Silver Medal
493	A. Miller-Hallett ..	Flying Fox's Electra	May 7, 1902	Jan. 18, 1914	131	39	6	1	1¾	35.49	17.75	9.10	26.85	
495	J. H. Smith-Barry	Foxglove ..	.. Sept. 1, 1910	Jan. 15, 1914	134	35	4	1	10	21.69	26.00	9.40	35.40	Certificate of Merit
496	J. H. Smith-Barry	Flower Girl ..	.. June 28, 1906	Jan. 16, 1914	133	37	0	2	0	18.50	32.00	9.30	41.30	E.J.C.S. Bronze Medal
497	J. H. Smith-Barry	Musette ..	.. July 30, 1909	Mar. 17, 1914	73	49	15	2	15	17.00	47.00	3.30	50.30	E.J.C.S. Gold Medal

XI.—THE EXHIBITION OF CIDER AT SWANSEA.

By Thos. F. Plowman, Secretary.

The entries of cider at the Swansea Exhibition in 1914 numbered 63, as against 51 at Truro in 1913, and 53 at Bath in 1912, the classification being the same in each case. Money prizes or medals and certificates, at the option of the prize-winners, were offered in each of the classes, which were as follows:

188.—Cask of not less than 18 and not more than 30 gallons of Cider, made in 1913 of a specific gravity not exceeding 1·015 at 60° Fahr.

189.—12 bottles of Cider, made in 1913, ditto.

190.—Cask of not less than 18 and not more than 30 gallons of Cider, made in 1913.

191.—12 bottles of Cider, made in 1913.

192.—12 bottles of Cider, made in any year previous to 1913.

Samples from each exhibit were submitted to Mr. F. J. Lloyd, F.C.S., for analysis, and particulars of these analyses are set out in the accompanying table. It is pleasant to have to record that there were no disqualifications or absentees.

Mr. J. Bennett, of Down House, Dursley, was the Judge appointed by the Society, and he fulfilled his duties on the first day of the Show.

Class	No.	Name of Exhibitor.	Specific Gravity At 60°F.	Alcohol by Volume.	Acid malic.	Solids per cent.	Awards.
188	1	Grew, J.	1·025	3·00	·53	7·14	
	2	Davis, H. J. ..	1·014	5·28	·34	5·17	R.
	3	Helps, H. J. ..	1·012	4·90	·41	4·53	3rd Prize
	4	Pullin Bros. ..	1·015	5·75	·45	4·08	2nd Prize
	5	Quantock Vale Cider Co.	1·011	5·70	·39	4·52	
	6	Tilley, W. T. S. ..	1·011	5·65	·29	4·62	
	7	Ditto	1·012	5·30	·28	4·65	1st Prize
189	8	Grew, J.	1·025	3·10	·58	6·90	
	9	Davis, H. J. ..	1·014	5·25	·41	5·13	
	10	Helps, H. J. ..	1·013	5·15	·36	4·58	2nd Prize
	11	Pullin Bros. ..	1·015	5·82	·42	5·37	3rd Prize
	12	Quantock Vale Cider Co.	1·011	5·55	·39	4·41	
	13	Ridler & Son ..	1·014	4·00	·50	4·39	1st Prize
	14	Stone, T.	1·014	5·00	·42	4·87	
	15	Tilley, W. T. S. ..	1·009	6·00	·27	3·85	H.C.
	16	,, ,, ..	1·012	5·25	·31	4·60	
	17	Vickery Bros. ..	1·014	5·17	·41	5·28	R.
190	18	Bearns, J. & Co. ..	1·027	2·85	·44	7·80	
	19	Davis, H. J. ..	1·027	4·15	·32	8·19	3rd Prize
	20	Ditto	1·032	3·22	·39	9·20	1st Prize
	21	Evans F. H. & Son	1·032	2·50	·34	8·87	

Class	No.	Name of Exhibitor.	Specific Gravity At 60°F.	Alcohol by Volume.	Acid malic.	Solids per cent.	Awards.
190	22	Grew, J.	1·028	3·12	·53	7·98	
	23	Helps, H. J. ..	1·008	5·80	·32	3·61	
	24	Quantock Vale Cider Co.	1·023	4·90	·34	7·34	2nd Prize
	25	Robbins, H. & Son	1·018	3·10	·34	5·35	
	26	Stone, T.	1·033	4·05	·36	9·52	
	27	Ditto	1·027	3·95	·46	8·02	R.
	28	Tilley W. T. S. ..	1·023	3·95	·29	7·25	H.C.
	29	Ditto	1·026	4·00	·29	7·89	
	30	Vickery Bros. ..	1·030	3·95	·41	9·08	
	31	Whiteway & Co. ..	1·018	4·90	·45	5·95	
191	32	Bearns, J. & Co. ..	1·024	3·17	·46	6·79	
	33	Davis, H. J. ..	1·024	4·45	·46	7·07	H.C.
	34	Ditto	1·032	3·55	·38	9·38	2nd Prize
	35	Ditto	1·032	3·10	·39	9·17	R.
	36	Evans, F. H. & Son	1·033	2·50	·54	9·05	
	37	Grew, J.	1·029	2·85	·53	7·90	
	38	Helps, H. J. ..	1·008	5·85	·42	3·69	
	39	Pullin Bros. ..	1·035	3·20	·47	9·80	
	40	Ditto	1·028	4·15	·42	8·47	
	41	Quantock Vale Cider Co.	1·029	4·65	·47	8·75	H.C.
	42	Ridler & Son ..	1·032	2·70	·56	8·98	
	43	Ditto	1·025	3·15	·41	7·05	
	44	Robbins, H. & Son	1·026	3·77	·61	7·84	
	45	Stone, T.	1·027	3·95	·48	8·04	
	46	Ditto	1·035	3·55	·55	10·14	
	47	Tilley, W. T. S. ..	1·021	4·55	·31	6·85	H.C.
	48	Ditto	1·031	2·83	·29	8·92	3rd Prize
	49	Ditto	1·030	3·52	·29	8·67	1st Prize
	50	Vickery Bros. ..	1·024	3·97	·39	7·58	
	51	Whiteway & Co. ..	1·033	3·95	·47	9·40	
	52	Ditto	1·026	3·12	·52	7·32	
192	53	Bearns, J. & Co. ..	1·018	3·60	·52	5·41	
	54	Grew, J.	1·029	2·85	·55	7·83	
	55	Davis, H. J. ..	1·028	4·80	·32	8·74	R.
	56	Ditto	1·027	3·73	·30	7·97	
	57	Jarrett. E. P. ..	1·026	1·80	·32	7·01	
	58	Pullin Bros. ..	1·017	4·25	·38	5·60	
	59	Ridler & Son ..	1·026	3·60	·35	7·85	H.C.
	60	Stone, T.	1·027	5·22	·52	8·43	3rd Prize
	61	Tilley, W. T. S. ..	1·021	4·80	·37	6·89	2nd Prize
	62	Ditto	1·024	4·10	·31	7·47	1st Prize
	63	Whiteway & Co. ..	1·032	2·85	·55	8·97	

XII.—THE NATURE STUDY AND HANDICRAFTS EXHIBITION AT SWANSEA.

By H. M. Cundall, I.S.O., F.S.A., Steward.

Owing to the restricted site of the Show-yard at Swansea it was found necessary to hold the Nature Study and Handicrafts Section in St. Gabriel's Hall, in Francis Street. The building was admirably suited for the display of the exhibits, but owing to its being situated just outside the Show Yard the exhibition was not visited to the extent it would otherwise have been if held under normal conditions. There was some difficulty in making the visitors to the Show understand that they could leave the yard for the purpose of inspecting the exhibition without any charge for re-admission.

The room on the ground floor of the hall was allocated to the Swansea Local Education Authority, and a very instructive exhibit from their Elementary, Secondary and Intermediate Schools was displayed there. Amongst the examples of Nature Study, the Plasticine models of simple flowers from the infant schools were very creditably executed. The brush work and botanical sketches from both the boys' and girls' Elementary Schools were good. The experimental apparatus for showing the germination of seeds, from Hafod Centre, and the botanical work and experiments from the Girls' Intermediate School, showed a satisfactory result of advanced instruction. In the Handicrafts Section there was a large collection of wood and metal work, with working drawings from the Municipal Centre, surveying instruments from James Street Centre, and a collection of woodwork models from Hafod Centre. All the work demonstrated that the Authorities are fully alive to the necessity of efficient instruction in handicrafts.

In the room on the upper floor of the hall the central space was allotted to the Glamorgan Education Committee. The collective exhibit consisted of works from (*a*) Primary Day Schools, including Higher Elementary Schools, (*b*) Technical and Evening Schools, and (*c*) County Intermediate Schools. It was one of the best exhibits demonstrating the course of instruction in Nature Study and manual work ever displayed at the Society's Shows. The examples of wood and metal work from various Technical and Evening Schools in the county were of a high standard, and special mention must be made of the carved lettering, submitted in a carving competition of the word "Ceiriog," by pupils of the Higher Elementary Schools. The specimens of wood carving from the Summer Holiday Course, held at Barry, were of exceptional interest.

The collective display from Merthyr Tydvil Education Committee was also of an instructive character. Education handwork was shown in gradations from infants' schools, through Senior Schools, into the Secondary Schools and Evening Technical Classes. From the girls' department of the Cyfarthfa Castle Municipal Secondary School, examples were exhibited of draughting, cutting and making garments together with an estimate of the cost, and of the quantity of material required; also decorative studies of plants with a view to their application for design for embroideries. From the boys' department of the same school, a selection of drawings from actual objects in connection with Nature Study and Natural History, besides examples of handicraft, were exhibited.

Collective exhibits were also sent by the Carmarthenshire, Llanelly and Pontypridd Education Committees.

The University College of South Wales and Monmouthshire, at Cardiff, contributed specimens of work done in the short courses in agriculture and dairy science.

All these collective displays were of high educational value, and the best thanks of the Society are due to the various Education Authorities for having organised such interesting and instructive exhibits from the schools and classes under their respective control. Thanks are also due to the officials of these bodies for the admirable arrangement of their respective exhibits, and especially to those officers of the Glamorgan and Swansea Education Committees, and of the Cardiff University. They were daily in attendance, during the time the exhibition was open, and the information they willingly gave respecting collections in their charge was evidently appreciated by the public.

XIII.—THE FORESTRY EXHIBITION AT SWANSEA.

By Godfrey Lipscomb, Steward.

In spite of the absence of one or two prominent exhibitors the Forestry Section at Swansea was fully representative, and quite maintained the standard reached in previous years. With the interest that is now taken in Forestry, one would be glad to see more serious and systematic attention given to it by the authorities. From time to time, owing to unemployment on a large scale, a possible shortage of pit props, or some similar emergency, the question of Afforestation receives spasmodic attention. As unquestionably it should be possible very largely to increase our supply of home-

grown timber, especially coniferous timber, with benefit to all concerned, it is, perhaps, not too much to hope that before long this question may be dealt with adequately by the Government.

The addition of a Forestry Section to many of the larger Agricultural Shows has undoubtedly stimulated interest in the subject.

In the Forestry Section now under discussion, Lord Stanhope took the gold medal for a general collection of exhibits illustrative of Forestry. He sent an excellent exhibit, most carefully prepared and well staged. It comprised sections and hand specimens of seventy-eight different kinds of timber; an extensive collection of seeds and cones; a very good collection of specimens showing the attacks from fungi to which timber is liable, and malformations and diseases in various kinds of timber in great variety, carefully collected and classified; photographs; named specimens of foliage, seedlings, etc.

The 2nd prize of a silver medal was awarded to Miss Talbot for a collection consisting of specimens showing the comparative growth of Japanese and Common Larch at the same age, much to the advantage of the former; named specimens of conifer foliage; specimens of diseases, etc.; a working plan of a large plantation with descriptive notes; hints on prevention of damage by fire; and a specification for contract planting, etc.

Lord Cawdor sent a small collection of seedlings, specimens of timber, seeds, photographs, etc.

In the classes for boards, the Scots Pine were a good, even lot, Lord Carnarvon being first with boards from a tree 100 years old (cubic contents 100 feet), while Lord Stanhope was second with boards from a tree 97 years old, grown at an altitude of 300 feet.

The Larch exhibits were not a very good lot. Lord Stanhope was first with boards from a tree 87 years old, grown at an altitude of 300 feet with a western aspect, and Miss Talbot second with those from a tree 60 years old, grown at an altitude of 100 feet with a south aspect.

Among the Spruce were some nice exhibits. The Trustees of the Llanover Estate took first prize with boards from a tree 70 years old, grown at an altitude of 190 feet with an east aspect, and Lord Carnarvon second with those from a tree, 90 years old, contents 105 cubic feet. The boards, from a tree 50 years old, grown at an altitude of 250 feet, sent by Lord Cawdor, were commended.

In the oak, ash and elm classes, Lord Cawdor was first. The oak and elm boards were good, and the ash was clean but small; all were grown at an altitude of 250 feet with a northern aspect, the oak being 130, the ash 60, and the elm 120 years old. Miss Talbot was second with very good elm but indifferent ash and oak exhibits,

the ash though large having passed its prime. All were cut from an altitude of 100 feet with southern aspect, the oak being 140, the ash 130, and the elm 150 years old.

In the class for 9ft. field gates, Lord Cawdor was first and Miss Talbot second. Both showed useful gates.

Among the non-competitive exhibits, the Director of the Royal Botanic Gardens, Kew, sent an excellent and instructive exhibit of 40 different kinds of timber, photographs of trees, illustrations of diseases and excellent samples of fruits and seeds of trees and shrubs.

The National Fruit and Cider Institute made a very interesting exhibit, illustrating insect and fungoid diseases of fruit trees and methods of dealing with the same, together with sections of grafting showing the nature of the connection made between the parent stem and the graft. In addition to these, the Institute showed samples of cider sickness and various cultures in connection with the manufacture of cider. The exhibit also included some strawberry plants, the result of careful selection and hybridization, the plants shown being the offspring of definite parent plants of different named varieties of varying habit and growth. It is most satisfactory to notice the progress made in the researches undertaken by this Institute for the improvement of the fruit and cider industries.

The exhibits both from Kew and Long Ashton were highly commended by the judge.

Dame Smyth, of Long Ashton, sent an excellent collection of photographs illustrative of Forestry, taken in the plantations and grounds of Long Ashton.

A silver medal was awarded to Miss Talbot for examples of creosoting by absorption in heat, a plan and particulars of the plant being exhibited.

In connection with the Forestry Section, Mr. J. Ettle, F.R.H.S., on each day of the show gave an excellent outdoor demonstration on the pruning of fruit trees. These were very much appreciated, and during and after each demonstration Mr. Ettle was kept hard at work for a considerable time answering the questions of his audience, who thereby showed that they were keenly interested and were anxious for information on special points.

The Committee were again indebted to Mr. George Marshall for his good services as judge.

The Forestry Section appears to be amply justifying its existence, and it is to be hoped that, with the revival of interest in the subject, the scope of the section may be extended.

XIV.—ANNUAL REPORT UPON THE SOCIETY'S GENERAL OPERATIONS.

By Thos. F. Plowman, Secretary and Editor.

The Annual General Meeting of Members was held on Saturday, May 30, in the Council Pavilion in the Show Yard, Swansea.

The President (Sir J. T. D. Llewelyn, Bart.), occupied the Chair, and there was a good attendance of members, including Sir H. Miles, Bart., Captain W. Best, the Rev. A. T. Boscawen, Messrs. C. P. Ackers, D. Alexander, W. Ashcroft, G. E. Lloyd Baker, J. Campbell, W. H. Clark, W. F. Cooling, H. M. Cundall, I.S.O., F.S.A., J. E. Daw, E. G. Dulcken, E. W. Farwell, H. A. Fry, J. T. Gibson, E. Lewis, G. Lipscomb, C. M. F. Luttrell, A. C. Major, J. E. Moore-Gwyn, H. B. Napier, F. J. Parker, G. Phillips, J. W. Porter, W. J. Rees, A. F. Somerville, E. G. Vevers, P. Veitch, Professor Penberthy, and others.

The Minutes of the previous Annual General Meeting having been read and confirmed, Mr. G. E. Lloyd Baker moved, Sir H. Miles seconded, and it was resolved: "That the Right Hon. the Earl of Coventry be elected President of the Society for the ensuing year."

Mr. A. F. Somerville moved, Mr. W. H. Clark seconded, and it was resolved: "That Mr. Geo. Gibbons be elected a Vice-President of the Society."

On the motion of the President, seconded by Professor Penberthy, the gentlemen named on page *xc* of the Appendix to this volume were elected members of Council for the years 1914–16.

The accompanying Report, which had been adopted at a meeting of the Council, held on the previous day, was then submitted to the meeting:—

Swansea Meeting.

The Council congratulate the Members upon once again visiting so important an industrial centre of the Principality as Swansea. The Society is always glad to avail itself of any opportunity to hold its Annual Meeting in Wales, for it can confidently count upon a hearty welcome and that popular support which brings a goodly throng to its Show Yard. The Society has long had a direct association with this portion of the United Kingdom, and it looks forward to the strengthening of the old ties in the years to come.

The present Show is the largest yet held by the Society at Swansea, the entries in point of numbers being well ahead, both in the Stock and Implement Departments, of those in 1892 and 1904.

Since the Society's last visit to Swansea, the Council, so far as their resources have permitted, have continued their policy of maintaining and adding to the interest and utility of the Annual Show by the institution of fresh departments, and in recent years the educational value of the Show has been materially increased by the addition of exhibitions illustrating Nature Study, Handicrafts and Forestry, whilst Demonstrations are also given by experts showing the most approved methods of tree-pruning, grafting and spraying.

Special mention must be made of a feature not usually found in the Society's Show Yards, viz., the Timbering and Splicing competitions, introduced at the suggestion of the Swansea Local Committee, who have kindly contributed the prizes. These trials of skill are appropriate to a colliery district, where it is so desirable to recognise and encourage good work of this class.

General Operations.

The Council have not limited their attention to the Annual Show, but, when opportunity has offered, have lent their support to various objects for the advancement of agriculture and kindred industries. Foremost among these is the National Fruit and Cider Institute, to which the Society makes an annual grant of £100. The Institute, the establishment of which was due to the practical and scientific research work initiated and conducted for some years, conjointly by the Society and the Board of Agriculture, at Butleigh, is now attached to Bristol University. Experimental and research work is being actively carried on at the Institute, which there is every reason to believe is of essential service to those engaged in cider-making and fruit-growing. An arrangement has been made under which members of the Society can obtain from the Institute, free of charge, analyses of cider apples and perry pears.

The Institute has also undertaken to distribute to the Society, or to persons nominated by it, free of charge, a selection of trees which have been worked with the best varieties of cider apples and perry pears, and has conferred upon the Society the privilege of nominating, free of all fees, one student for a course of instruction in the theory and practice of fruit-growing, cider-making, etc., to be held by the Institute at the University of Bristol.

With a view to assisting farmers and others in dealing with insect and other pests which affect agriculture, horticulture, etc., the Council have availed themselves of an offer from the Board of Economic Biology of the University of Bristol, to investigate the nature of any insect or other pest, and report upon it free of charge.

Appointments.

Mr. A. O. Sillifant having resigned as the Society's representative upon the Tuberculosis (Animals) Committee, the Council have appointed Mr. F. H. T. Jervoise in his place.

The International Dairy Federation having invited the Society to appoint a representative on the British section of that body, the Council have appointed Mr. A. F. Somerville.

The Council have re-nominated Mr. H. B. Napier, whose term of office had expired, as a Governor of the National Fruit and Cider Institute.

Lawes and Gilbert Centenary.

The Committee of the Rothamsted Experimental Station recently proposed to celebrate the centenary of the birth of Sir John Lawes and Sir Henry Gilbert, the founders of the Station, by erecting and equipping a Commemoration Laboratory wherein the work they commenced should be continued. A Special Committee was formed in furtherance of this object, and your Council, in response to an invitation to be represented on it, appointed the President (Sir J. T. D. Llewelyn), and made a special appeal to the Society's members in support of the memorial fund. This was liberally responded to by the President and other members, while the Council made a special grant of Twenty Guineas from the Society's funds in the full belief that this recognition of the claims to remembrance of two such pioneers of modern scientific agriculture as Messrs. Lawes and Gilbert would be in accordance with the wishes of the members generally.

Thanks.

The Council desire to acknowledge the gracious courtesy of the Royal Agricultural Society of England in unanimously electing the Bath and West Society's Secretary and Editor as an honorary life member of their body, in recognition of his services to agriculture; the value of the compliment being enhanced by the bestowal at the same time of a similar honour upon M. Henri Sagnier, Secretary of the National Agricultural Society of France.

Deaths.

The Council regret that during the past year death has deprived the Society of several old and valued supporters, the following members of Council having passed away:—Mr. E. W. Williams, a

Vice-President, who for many years rendered valuable service as a Steward of Horses; Mr. C. N. P. Phipps, a Steward of Finance, an ever-ready helper of all that promoted the Society's interests, and a staunch upholder of its best traditions; Mr. M. J. Sutton, whose expert knowledge, especially in connection with the Experiments and Education Committees, was always most willingly placed at the Society's disposal; Colonel E. H. Llewellyn, a Steward of Finance, the charm of whose personality endeared him to all associated with him; and Mr. J. S. Smythe Osbourne, whose assistance as a Deputy Steward of Stock, especially, was always as welcome as it was cheerfully rendered.

Recommendations to Office.

The Council have much pleasure in recommending that the Earl of Coventry be elected President for the ensuing year; that Mr. Geo. Gibbons, in recognition of the valued service he has rendered to the Society, and to Agriculture generally, in connection with dairying especially, be elected a Vice-President of the Society; and that the gentlemen named on the Agenda Paper be elected members of Council for the years 1914–16, in the room of those retiring by rotation.

1915 Meeting.

The Council have accepted a cordial invitation from the Corporation of Worcester for the Society to hold its 1915 Exhibition in that city, and a very suitable site has been secured for the purpose. The Committee have particular pleasure in stating that the invitation had the hearty support of the Herefordshire and Worcestershire Agricultural Society, who have arranged to amalgamate their own show with that of the Bath and West for the year.

1916 Meeting.

The Council have further pleasure in reporting that they have accepted a cordial invitation from Salisbury for the Society to hold its 1916 Meeting in that City.

The adoption of the Report was moved by the President, seconded by Professor Penberthy, and agreed to.

Mr. H. B. Napier moved, Mr. D. Alexander seconded, and it was unanimously resolved:—"That the thanks of the Society be presented to the Mayor of Swansea and to the Swansea Local Committee

for the cordiality with which they have received the Society, and for their efforts to promote the success of the meeting."

This was responded to by Mr. F. J. Parker (Hon. Local Secretary), and Mr. F. F. Mason (Chairman of the Local Committee).

On the motion of Mr. H. A. Fry, seconded by Mr. E. Lewis, a vote of thanks was accorded to the Judges.

Mr. G. Lipscomb, in moving a vote of thanks to the President, referred to the very active interest he had taken in the work of the Society during the past year, whilst he had presided over their meetings with the greatest ability and geniality.

Mr. C. M. F. Luttrell seconded, and Sir J. T. D. Llewelyn having briefly returned thanks, the proceedings terminated.

XV.—ANNUAL REPORT OF THE SOCIETY'S CONSULTING CHEMIST.

(*Dr. J. A. Voelcker, M.A., F.I.C., etc.*)

During the past year seven samples were submitted by members for analyses, and there were also three consultations.

The samples sent were as follows:—

Cocoa-nut Cake	1
Soot	1
Refuse from Wool-cleaning	1
House Refuse	1
Waters	3
	7

Cocoa-Nut Cake.

This material has of late come much more widely into use, and, when in sound condition, should make a very desirable food, especially for dairy cattle. The sample submitted to me gave the following:—

	Per cent.
Oil	6·09
Albuminoids	20·00
Sand	·44

This cost £7 per ton delivered, and was a nice clean cake in good condition.

Soot.

The quality of soot—as I have frequently pointed out—varies much, according to the source from which it is derived. Soot from

factory chimneys is frequently of very inferior quality, and the sample sent me was of this nature. It came from a factory chimney in Lancashire. The analysis was :—

Moisture	16·55
*Organic Matter	57·08
Oxide of Iron, etc.	15·65
Siliceous Matter	10·72
	100·00
*Containing Nitrogen	1·24
Equal to Ammonia	1·50

Refuse from Wool-Cleaning.

The analysis of this was as follows :—

Moisture	11·95
*Organic Matter..	65·17
†Mineral Matter..	22·88
	100·00
*Containing Nitrogen	1·96
Equal to Ammonia	2·38
†Including Sand..	10·45

House Refuse.

Taken purely on the analytical figures, materials of this kind might be expected to have a certain amount of manurial value. The fertilising constituents, however, are in such an unavailable form that it is very doubtful whether any real manurial value is attaching to them. On the other hand, there is no question that, on certain kinds of land, the mechanical benefit from their use is of a marked nature. The following is the analysis of a sample of such refuse which was sent to me, and which cost 2s. 6d. per ton, delivered on the land :—

Moisture	24·90
*Organic Matter	21·10
Carbonate of Lime	7·70
Oxide of Iron, etc.	16·05
Sand	30·25
	100·00
*Containing Nitrogen	·69
Equal to Ammonia	·84

Waters.

Three samples of water were sent to me. The first was a water from Wales and was of decidedly soft nature, containing only 11·76

grains per gallon of total solid constituents. It was, however, found to contain Zinc in solution, the water having evidently acted upon the galvanized iron pipes in which it was conveyed.

On a further sample being subsequently sent, this was found to contain no less than ·56 grains per gallon of Zinc Oxide in solution, this being decidedly more than should occur in a regular drinking supply.

The third sample of water was found to be of hard nature and to contain 40·04 grains per gallon of total solid constituents, these being composed mainly of lime salts with some magnesia salts. Advice was given as to methods of softening it.

The consultations had reference to:—

(1) The use of some chemical material for exterminating rabbits from burrows.

(2) The suitability of a particular manure for grass lands, and

(3) The destruction of weeds in ponds.

XVI.—THE NATIONAL FRUIT AND CIDER INSTITUTE.

By B. T. P. Barker, M.A., Director.

The following report contains an account of the work which has been carried on during the past year at the Research Station, Long Ashton. As indicated in last year's report, the association of the Institute with the University of Bristol has resulted in the widening of the scope of work undertaken at Long Ashton; and this now extends beyond the sphere originally contemplated when the Institute was established. The additions to the research staff now enable a much larger amount of research to be undertaken than hitherto, and it is not possible, in the limited space available here, to give a complete account of all the work carried on at the Institute. Those who desire to learn more of the extent of the work of the Institute are referred to the Annual Report of the Department of Agricultural and Horticultural Research, which is published each year in May. Since the last volume of this Journal was issued, the new laboratories at Long Ashton have been completed and have been in regular use during the year. The new wing of the cider house was finished last spring, and has been available for the cider work of the current season. Alterations to the old buildings have still to be made, since it was found impossible to get the work carried through before the beginning of the cider season

last autumn. The new buildings were formally opened on June 26th last by the Right Hon. Walter Runciman, M.P., at that time President of the Board of Agriculture and Fisheries.

The following accounts of various investigations that have been made during the past year have been furnished by the members of the research staff responsible for the work in each case; and I am much indebted to Messrs. C. T. Gimingham, F.I.C., O. Grove, and A. H. Lees, M.A., for their help in this way.

Investigations on Cider Problems.

Single Variety Ciders and Perries.—During the season 1913–14 a number of varieties of cider apples and perry pears were tested in the cider house for vintage quality. The method of treatment was that which has already been described in earlier reports. The list of varieties and an analysis of the juice in each case are given in the accompanying table. Details of the characters of the individual ciders will be published in the Annual Report of the Department for 1914; but a few remarks on the general character of the ciders and perries may be made here.

The summer of 1913 having proved so hot and dry, it was expected that the quality of the fruit and of the cider would be well above the average. The accompanying table shows that, while in the case of a few juices, such as Kingston Black, Nos. 1 and 4, higher gravities than are characteristic of the variety were obtained, most of the gravities did not rule particularly high, and in some cases, such as Cherry Norman, they were appreciably lower than usual. The acidities, as anticipated, were decidedly lower than those of the previous year in the case of sweet and bitter-sweet varieties. The sharp varieties, however, did not present any great variation from the results of 1913. The amount of tannin, while not being remarkably high, was probably fairly up to the average. The most striking feature for the season was the comparatively low rate of fermentation which was shown by the great majority of the juices. This feature, combined with the somewhat low acidity of the sweet and bitter-sweet varieties, was undoubtedly responsible for the very considerable number of outbreaks of sickness which occurred during the summer of 1914. In fact, cider sickness was perhaps more prevalent among the Institute ciders then than in any previous season.

The Treatment of Cider Sickness.—Most of the juices from the varieties of cider apples made into cider during the season 1913–14 showed a very slow fermentation; and as experience

Single Variety Ciders and Perry.

In each case the pomace was pressed immediately after milling, and allowed to ferment naturally in cask, without keeving, until the specific gravity had dropped to 1·030—1·040, when the liquor was filtered. In most instances a second filtration was necessary.

Name of Variety.	District where grown.	Date of making.	Specific Gravity of Fresh Juice.	Malic Acid per cent.	Tannin per cent.	Rate of Fermentation at 28° C.	Present Specific Gravity.
APPLES—Sharp Varieties.							
Pople	Oldbury	18th December	1·043	·73	·25	7·2	1·016
Pull Court Red	Tewkesbury	13th November	1·050	·53	·20	7·7	1·020
*Ditto	Ditto	13th November	1·050	·53	·20	7·7	1·026
Dymock Red	Ledbury	11th November	1·054	·50	·23	4·1	1·021
Yeovil Sour	Martock	4th December	1·048	·38	·19	3·2	1·024
Skyrme's Kernel	Boddington	4th December	1·054	·57	·22	2·6	1·022
*Ditto	Ditto	4th December	1·054	·57	·22	2·6	1·028
Brice's Kernel	Tewkesbury	12th November	1·045	·64	·15	4·3	1·023
Red Soldier	Ledbury	11th November	1·053	·73	·18	3·9	1·023
Cap of Liberty	Martock	20th November	1·050	·78	·25	2·6	1·027
Cowarne Red	Boddington	13th November	1·050	·41	·21	3·6	1·029
Yellow Styre	Tewkesbury	23rd October	1·058	·62	·06	3·6	1·029
Bickington Grey	Newton Abbot	20h November	1·050	1·01	·20	3·0	1·030
Kingston Black—1	Pendock	29th October	1·069	·67	·13	4·6	1·031
†Ditto	Ditto	29th October	1·069	·67	·13	4·6	1·015
Kingston Black—2	Tewkesbury	6th November	1·053	·48	·20	5·5	1·026
†Ditto	Ditto	6th November	1·053	·48	·20	5·5	1·015
Kingston Black—3	Thornbury	6th November	1·059	·57	·10	5·1	1·029
†Ditto	Ditto	6th November	1·059	·57	·10	5·1	1·005
Kingston Black—4	Martock	19th November	1·069	·59	·25	2·8	1·036
Gatcombe Apples	Long Ashton—						
No. 1	Fermented with Yeast No. 31	11th December	1·052	·36	·14		1·019
No. 2	Natural Fermentation	11th December	1·052	·36	·14		1·023
No. 3	Fermented with Yeast No. 25	11th December	1·052	·36	·14		1·018
No. 4	Keeved 6 days	11th December	1·052	·36	·14		1·009

Sweet Varieties.							
Queen Anne	Martock	29th October	1·048	·13	·05	4·3	1·017
Truckle	Ditto	26th November	1·059	·32	·18	4·2	1·027
Large White	Ditto	19th November	1·050	·23	·18	4·1	1·028
Slack ma Girdle	Newton Abbot	12th November	1·049	·21	·13	5·0	1·032
(filtered 8/12/13)							
Ditto	Ditto	12th November	1·049	·21	·13	5·0	1·017
(filtered 12/1/14)							
Ditto	Ditto	12th November	1·049	·21	·13	5·0	1·033
(sulphured)							
Sweet Alford	Newton Abbot—						
No. 1	Fermented with Yeast No. 24	12th October	1·049	·15	·20		1·025
No. 2	Do. do. No. 30	12th October	1·049	·15	·20		1·026
No. 3	Do. do. No. 34	12th October	1·049	·15	·20		1·027
No. 4	Natural Fermentation	12th October	1·049	·15	·20		1·021
Bittersweet Varieties.							
Colebrook	Martock	29th October	1·059	·19	·22	5·1	1·012
Cherry Norman	Bosbury	4th November	1·045	·16	·26	7·0	1·016
Jersey's No. 2	North Cadbury	4th December	1·052	·15	·28	3·8	1·016
Ashton White	Long Ashton	14th October	1·048	·17	·33	6·5	1·020
Farmer's Friend	Martock	29th October	1·049	·17	·20	5·3	1·020
Royal Jersey No. 2	Ditto	4th December	1·051	·21	·28	5·1	1·020
Duke of Bedford	Oldbury	4th December	1·042	·22	·20	5·7	1·021
Middle Streak	North Cadbury	23rd October	1·051	·17	·30	6·1	1·022
Cadbury No. 1	Ditto	29th October	1·051	·24	·32	4·5	1·023
(filtered 1/12/13)							
Ditto	Ditto	29th October	1·051	·24	·32	4·5	1·009
(filtered 12/1/14)							
Little Wilding	Ledbury	20th November	1·053	·16	·23	6·8	1·025
Strawberry Norman	Ditto	26th November	1·052	·35	·32	6·1	1·025
Masters' Jersey	North Cadbury	18th December	1·058	·18	·30	4·3	1·026
Pocket Apple	Newton Abbot	12th November	1·052	·33	·20	4·1	1·026
White Norman	Bosbury	4th November	1·054	·21	·23	3·4	1·027

* Fermented with pure Yeast. † Racked instead of filtered.

SINGLE VARIETY CIDERS AND PERRY—*continued.*

Name of Variety.	District where grown.	Date of making.	Specific Gravity of Fresh Juice.	Malic Acid per cent.	Tannin per cent.	Rate of Fermentation at 28° C.	Present Specific Gravity
BITTERSWEET VARIETIES—*continued.*							
Twistbody Jersey	Martock	11th November	1·061	·20	·45	5·3	1·028
Horner	Ditto	20th November	1·054	·16	·26	5·2	1·029
Jersey No. 4	North Cadbury	4th December	1·050	·19	·22	5·0	1·029
Ditto (sulphured)	Ditto	4th December	1·050	·19	·22	5·0	1·022
Royal Jersey No. 1	Martock	13th November	1·053	·21	·38	4·4	1·033
*Ditto	Ditto	13th November	1·053	·21	·38	4·4	1·024
PEARS.							
Coppice	Malvern	14th October	1·051	·38	·38	5·3	1·017

* Fermented with pure Yeast.

has shown that slow fermenting juices are especially liable to sickness, a good deal of this very serious disease among them was anticipated. As a matter of fact, sickness turned up during the spring of 1914 in many of the sweeter ciders. Ciders made from the following varieties went sick : Sweet Alford, Pocket Apple, Slack-ma-Girdle, Royal Jersey, Taylor's Bitter, Horner, Truckle, Duke of Bedford, Gatcombe Apple and Master's Jersey. All these juices contained less than ·5 per cent. of malic acid and had been filtered when the specific gravity had reached 1·025—1·030 ; so they possessed a fair amount of sweetness.

Ciders filtered early, with comparatively high specific gravities and containing over ·5 per cent. of malic acid are not, as a rule, very liable to sickness ; but during last season a case of sickness occurred in a Kingston Black cider containing ·59 per cent. of malic acid. This cider showed a remarkably slow fermentation, the gravity only falling from 1·069 to 1·039 in the course of three months. It was filtered when the gravity had reached that point and went sick four months later.

Several experiments in casks were carried out to remedy or prevent sickness, and for those experiments a Sweet Alford juice was used. This juice showed a very slow fermentation, the original gravity being 1·049 at the making on October 12th, 1913 ; and this had only fallen to 1·036 on February 2nd, 1914, when it was filtered. Sickness started two months later. The following experiments were started in April with several casks of the Sweet Alford cider, all of which showed the beginning of sickness.

(1) To a 50 gallon cask of a cider of 1·025 specific gravity, and containing ·21 per cent. of malic acid, were added 22·5 grams of sulphur dioxide gas (1 part to 10·000 parts of cider). The cask was left for six weeks and examined. The specific gravity had fallen three points, and a distinct smell and flavour of sickness had developed. The sample was kept for about six months, but the sickness symptoms increased, and the cider became quite undrinkable.

(2) Thirty gallons of the same Sweet Alford cider were mixed with 30 gallons of a sharp cider (Bickington Grey, sp. gr. 1·030, acid 1·01 per cent.) ; the mixture had a specific gravity of 1·029 and contained ·5 per cent. of malic acid. After six weeks there was no smell or taste of sickness, and the blend was of a very pleasant, brisk character. The gravity had fallen to 1·025. After six months the cider was still very good and no sickness developed.

(3) To a 30 gallon cask of the same Sweet Alford cider was added 4 grams of tartaric acid per litre (about 4lbs. per 100 gallons). The

specific gravity was 1·031 and the acidity brought up from ·21 per cent. to ·56 per cent. by the addition of the tartaric acid. After six weeks no sickness had developed, and the specific gravity remained the same. To another cider showing the beginning of sickness, but in a less pronounced degree than the Sweet Alford, was added 2lbs. of tartaric acid per 100 gallons. No sickness developed, although it occurred in a cask of the same cider kept as a control.

(4) To a 60 gallon cask of the sick Sweet Alford cider was added half a gallon of thick brewer's yeast. The yeast had first been carefully washed by stirring it up with cold water, which was poured off when the yeast had settled down. The yeast deposit was then again stirred up with fresh water, and this operation was repeated four times, until the yeast became quite white without smell or taste of hops. The specific gravity of the cider was 1·027, and the acidity ·21 per cent. A strong fermentation started, and after six weeks the cider was filtered. The specific gravity was then 1·008, and the cider had no smell or taste of sickness: but it was, of course, rather dry, as it had been allowed to ferment so far. Experiments on the same line were carried out with other sick ciders in the beginning state of sickness, and it was found, that it is not necessary to ferment as far down as in the above-mentioned case to prevent sickness. For instance, another cider made from a mixture of fruit, the juice having a specific gravity of 1·056, and an acidity of ·37 per cent., was filtered when the gravity in the course of three months had fallen to 1·037; and as it developed sickness later on, to one cask was added washed brewer's yeast. It was allowed to ferment down to 1·015 before filtering. This cask did not develop sickness; and the cider remained very good and kept clear and sound for over the six months during which it was held in store.

(5) A cask of the same Sweet Alford cider was aerated by means of blowing air through it for a few hours every day for a fortnight, it being possible that the acceleration of the fermentation produced by the aerating would be detrimental to the development of the sickness bacillus. This was, however, not the case. After six weeks the specific gravity had fallen to 1·016, and the cider was very badly attacked by sickness.

As a conclusion of the above experiments, it can be said that when a cider is supposed to be liable to sickness, or when the first indications of the disease are noted, it is possible to remedy or prevent the sickness by one of the above-mentioned methods, 2, 3 or 4. The methods 2 and 3 have really the same object, namely, to augment the amount of acid present, the acid acts as a preventive

of the growth of the sickness bacillus. If a cider made of sharp apples is at disposal, it can be added to the cider beginning to show signs of sickness in such a proportion that the acidity of the mixture is at least ·5 per cent. If tartaric acid is used to augment the acidity, about 2lbs. per 100 gallons of cider will in most cases be sufficient.

The first method is, of course, the most natural, as no foreign body is introduced into the cider, but there can be no objection to using the tartaric acid in the proportions mentioned, as it is a natural constituent of many fruits, especially of grapes, from which it is made for commercial uses. As to the treatment with brewer's yeast it has the disadvantage that it reduces the sweetness of the cider, and cannot be used if it is desired to keep the cider at the original high gravity, because to ensure a good result it is necessary to ferment the cider 10–15 points down, thus changing it from a sweet cider to a drier one. It has not yet been settled how far down it is necessary to let the cider ferment, but it will probably be found that at least a drop of 10 points is necessary. This naturally differs with the different juices and the degree of sickness present.

Instead of brewer's yeast, pressed yeast (German yeast) can be used in the proportion of about 2lbs. per 100 gallons of cider. Pressed yeast has the advantage that it does not contain any hop-particles and does not need washing, as it has already been washed in the yeast-factories. It must, of course, be quite fresh.

It is possible that in many cases sickness could be prevented by accelerating the first vigorous fermentation of the juice and by repeated early racking. The acceleration can be carried out by keeping the casks at a higher temperature (60–65° F.), by keeving, and also by adding a certain proportion of phosphate of ammonia as a yeast-food (1 oz. per 100 gallons). The bacillus causing the sickness is probably only present in small quantity in the original juice, and would in many cases be eliminated by a vigorous fermentation and repeated racking.

Acetification in Cider.—One of the greatest enemies to cider is the vinegar-ferment (acetic acid-producing bacteria), which, as is well-known, in a short time can transform the best cider into a sour, undrinkable liquid. It has been mentioned several times in the reports from this Institute; but it cannot be repeated too often, that a sure remedy against this very common disease is to keep the cider out of touch with the air. The micro-organism which transforms the alcohol in the cider into acetic acid can only do so when air is present. Consequently, when air is excluded, no acetification will occur. As long

as a vigorous fermentation takes place in the juice, and the yeast is in strong activity, there is not much danger of the acetic ferment starting, because the development of carbonic acid gas produced during fermentation acts as a disinfectant against the acetic acid-forming bacterium. Consequently, when working according to the usual method, *i.e.*, fermenting the juice in the casks turned upon their sides and completely filled, there is no danger in leaving the bung-hole open during the first 12–14 days; but after this time, when the strong fermentation has stopped, and no more froth is discharged from the bung-hole, it is indispensable that the bung-hole should be closed in such a way that the fermentation gas can escape, but that no air from outside can get into the cask.

There have been made several different forms of apparatus to achieve this object, all working upon the same principle, that is, forming a liquid trap, through which the fermentation gas escapes. We have introduced a model of a trap this season, which has worked very satisfactorily. It is easily fixed in the bung, and is also very cheap. It consists of a U-shaped glass tube, with two bulbs, opposite each other. One end of the U-tube is longer than the other, and is bent completely over just above its bulb. It is fixed vertically through a hole bored in a cork fitting into the bung-hole of the cask. The cork may be with advantage dipped into melted paraffin-wax before it is used. This treatment makes it completely air-tight. In the U-tube is placed a little water, so that about one-third of each of the two bulbs is filled. It is better to use instead of water a mixture of equal parts of water and glycerine, to prevent evaporation. The fermentation-gas will bubble through the glycerine-water, but no air can enter from outside.

When the cider is finished and kept in casks tightly bunged down, it is often found that it is difficult to keep the usual small bungs airtight, especially as they have to be removed now and again for the purpose of refilling the cask to replace the cider lost by evaporation. It is not a good plan to use paper or sacking for tightening up the bungs, because the paper very often bursts, and the sacking is wet and porus, allowing air to enter, and very often nursing a powerful breed of acetic-bacteria in its loose tissue. We have introduced a new kind of bung, which has given entire satisfaction. As a matter of fact, not one of over 100 casks kept closed down with this type of bung showed the least trace of acetification, although many of them were kept at a rather high temperature, which is very favourable for the development of the acetic ferment.

The bung is of a long and tapering shape, made of wood and covered with several layers of canvas treated with paraffin-wax.

The wooden bung has the following dimensions: Diameter of bottom end, $1\frac{7}{8}$ inches; ditto of top end, $2\frac{5}{8}$ inches; length, $7\frac{1}{2}$ inches. The bungs used here are made of ash-wood, but it does not matter much what kind of wood is used, as long as it does not split too easily and does not communicate any flavour to the cider. The canvas cover is fixed in the following way: A piece of canvas is cut according to a suitable shape, of a sufficient size to go round the bung 3–4 times, covering the sides of the wood completely with exception of an inch or so left bare at the top. A saucepan with melted and hot paraffin wax is kept ready, and the wooden bung inserted into the liquid wax, which is brought to cover its sides and bottom completely, dipping it several times, so that the wax soaks well into the wood. The wood must, of course, be thoroughly dried first. Before the wax has set, the canvas is rolled tightly round the bung, and the whole is again dipped into the melted wax, so that the canvas is completely permeated. This bung is driven into the bung-hole by a wooden mallet. The bung-hole must be of such a size that $\frac{1}{3}$–$\frac{1}{2}$ of the length of the bung enters the cask, dipping into the cider. The role of the paraffin-waxed canvas is to give the surface of the bung a certain elasticity, so that small irregularities in the shape of the bung-hole are filled up.

In addition to its other advantages this bung is very easily removable, because a good hold can be got on the part outside the cask. It can also be used year after year, being comparatively imperishable.

Pure Yeast Fermentation Experiments.—During last season some experiments were made on the employment of pure yeasts for the fermentation of apple-juice. The use of pure yeast, which is now general in most fermenting industries has for some years been more or less successfully practised with apple juice in several countries. The types of yeast employed are either selected from the different kinds of yeasts naturally present in fermenting apple-juice, or pure yeast from other sources, *e.g.*, wine-yeast, are employed. The objects, as explained in previous Reports, are in the first place to get a more regular and cleaner fermentation, and also to improve upon the aroma and flavour of the cider by suppressing the growth of undesirable yeast-types or other micro-organisms present in the juice. When using yeast from wine, the yeast is cultivated from wines, which are known for their fine aroma and flavour, and as the yeast, through the fermentation, contributes to the bouquet of the wine, it is to be expected that a part of the aromatic bodies, developed by the action of the yeast, are also produced, when the wine yeast is cultivated in

apple-juice instead of grape-juice. The experience has shown that in many cases a great improvement has been obtained by using such a selected yeast for the fermentation of apple-juice.

The pure yeast is cultivated in special vessels containing a sterilized, favourable medium—in our case, apple-juice,—and, when a sufficient crop of yeast is obtained, it is added to the bulk of the material to be fermented, which can either be previously heated to such a température that all living cells present in it are killed—as, for instance, in the brewing industry—or used in its natural state. In the first case the yeast will be alone and without competition from other micro-organisms; in the second case there is already a varying quantity of different kinds of yeast and other living germs present. It is clear, that a much cleaner and more regular fermentation is obtained, when it is possible, by heating, or otherwise to destroy undesirable micro-organisms already present in the material before adding the selected yeast. In the case of apple-juice there is, however, the difficulty, that heating affects the flavour. It will very probably, be possible to remedy this to a certain extent by heating to a comparatively low temperature, which, without killing all the micro-organisms, will affect them in such a way that their vitality is seriously set back, thereby making them less dangerous as competitors to the selected yeast. Possibly a treatment with ultra-violet rays, which can be made at a very low cost (a few pence per 100 gallons), when the necessary apparatus is at hand, would be efficient to bring about the desired sterility of the juice. Experiments on these lines will be carried out later.

As it is, the method we have followed is to add the selected yeast to the freshly pressed juice in large quantities, so that it has the opportunity of out-growing the other micro-organisms already present in the juice. We have cultivated each type of yeast in a specially made tinned copper-vessel (Carlsberg tin) containing about 2 gallons of sterilized apple-juice, adding one of these cultures in full fermentation to a hogshead of 54–60 gallons of freshly expressed apple-juice.

The cultures of pure yeast, which have been developed, and are kept in the laboratory at a suitable temperature, are, according to our results, more sensitive to unfavourable circumstances than the natural yeast found in the juice, and especially is that the case as regards temperature. It is therefore necessary for obtaining good results with pure yeast, that the temperature of the fermenting liquid should be kept sufficiently high to be favourable to the growth of the selected yeast. The temperature generally considered the best in dealing with apple-juice is about 60° F., and this temperature

must be kept at any rate during the beginning of the fermentation. For most juices it will be sufficient to keep that temperature for 5–6 weeks, or until the fermentation has proceeded to the point wished, *e.g.*, to a specific gravity of 1·025. When that is reached, a lower temperature is desirable, especially if the cider is filtered. If a low temperature, *e.g.*, 40–45° F. is maintained during the first period of the fermentation, the pure yeast added will not be able to develop well, and the different, natural yeasts in the juice will get the upper hand; and consequently the pure yeast will be suppressed and have no influence upon the final result.

Unfortunately, until the cider buildings at the Institute are completed, we cannot regulate the temperature of our fermenting room. During the season 1913–14 many of the juices to which were added pure yeast cultures had to be kept during the fermentation in an open shed exposed to irregular and sometimes very low temperatures. In the beginning of December, 1913, the temperature of the juices had fallen to 36–37° F., and consequently in most cases the pure yeast added was completely out-grown by the natural more cold-resisting yeast-types. In such cases the influence of the selected yeast could not be traced, and the cider made showed no difference in aroma and flavour from the cider made from the same juice, but left to ferment naturally. Repeated microscopical examinations during the fermentation of the juices to which were added pure yeast showed that the yeast added was gradually more and more suppressed by the natural yeast-types, as the fermentation proceeded.

As regards the rate of fermentation, there was not much difference between the juices to which had been added pure yeast, and the corresponding juices left to ferment naturally. It would be expected that the juices fermented with pure yeast would show a quicker fermentation. This would certainly be the case, if convenient temperatures were maintained.

The Relative Value of Cane and Beet-Sugar for Fermentation Purposes.—The value of different cane-sugars and beet-sugars for sweetening cider were tested in a series of experiments, especially to find out the difference between cane and beet-sugar as regards flavouring of cider.

The samples of cane-sugars used were the types commercially described as Standart 11, Standart 14, Standart 15, and a sample of raw cane-sugar. The beet-sugars used were the type called star granulated, and a sample of raw beet-sugar. The sugars were kindly supplied by Mr. J. A. Sanders, Cotham Vale, Bristol.

The cider used for the sweetening experiments was the same in all

cases, and consisted of a mixture of several dry ciders. It had a specific gravity of 1·008, and contained ·42 per cent. of acid.

The fermentations were carried out in 1 gallon bottles completely filled and furnished with a rubber-stopper with a fermenting trap of the pattern described above in the section dealing with acetification.

The sugar was in all cases dissolved in the same quantity of boiling water, and boiled for 15 minutes to sterilize the sugar syrup. It was then cooled and mixed with the cider. All the samples were kept under exactly similar conditions at the ordinary room temperature.

			Sp. gr. at start, 25 Mar., 1914.	Sp. gr., 8 July, 1914.	Sp. gr., 15 Dec., 1914.
1	Cider alone (control)	..	1·008	1·005 clear	1·005 clear
2	Cider+5% Cane-sugar	St. 11	1·023	1·013 very cloudy	1·006 very cloudy
3	Cider+5% Do.	St. 14	1·022	1·013 clear	1·013 very cloudy
4	Cider+5% Do.	St. 15	1·022	1·013 very cloudy	1·013 very cloudy
5	Cider+5% Beet-sugar	..	1·022	1·012 clear	1·012 clear
6	Cider+10% Cane-sugar	St. 11	1·031	1·027 clear	1·023 very cloudy
7	Cider+10% Do.	St. 14	1·030	1·025 clear	1·025 clear
8	Cider+10% Do.	St. 15	1·031	1·027 clear	1·023 very cloudy
9	Cider+10% Beet-sugar	..	1·031	1·025 clear	1·025 clear
10	Cider+6% raw Cane-sugar	..	1·027	1·014 clear	1·014 clear
11	Cider+6% raw Beet-sugar	..	1·026	1·009 clear	1·008 clear

There was not much difference between the different bottles as regards visible signs of fermentation. The 5 per cent. started fermentation a few days before the 10 per cents., and kept up a more rapid fermentation the whole way through, the decrease in specific gravity being 9–10 points, whereas the 10 per cents. only had lost 4–6 points, when fermentation stopped.

After about two months at room temperature the fermentation was apparently completely finished, only rarely a bubble of gas being observed to mount to the surface. On the 8th of July, after about three and a half months, the samples were filled in bottles to be kept for comparison of flavour. When bottled all the samples were clear with a yeast-deposit, with exception of 2 and 4, which both were very cloudy and had a large sediment in addition to the yeast-deposit. This sediment consisted chiefly of matter precipitated from the cider and a bacterial growth, which was the cause of the precipitation taking place. The bacterium was a rather long, irregular rod-shaped organism, showing characteristic angular and zig-zag forms.

During the autumn this bacterial disease gradually turned up in all the samples sweetened with cane-sugar except 7 and 10, both of which kept clear.

When the ciders had been kept for a month in bottles, their aroma and flavour were compared, and this comparison was repeated several times during the autumn. As a result it must be said that as far as these samples of sugars are concerned, the beet-sugars gave a better result than the cane-sugars. Leaving out of consideration that most of the samples sweetened with cane-sugar did not keep but were attacked by a bacterial disease, whereas all the beet-sugar samples remained in good condition, the flavour of the cane-sugar samples was in all cases inferior (except perhaps in the case of the raw-sugars, where no difference in flavour could be noted between the beet and cane-sugar samples). That is, the peculiar taste of cane-sugar was easily detected, whereas the beet-sugar did not give any new flavour to the cider, but simply acted as a neutral sweetener, which, of course, is preferable. This result, being somewhat contrary to previously accepted views in this country, needs further confirmation by fresh experiments before much importance can be attached to it.

The Blackening of Cider.—It is sometimes the case, that cider, which has been kept in bottles or casks, when poured out into a glass or otherwise exposed to the action of the air, in a short time—sometimes in 5 to 10 minutes—changes colour, assuming a greenish-black tinge.

The cause of this generally is that the apples or the juice during the making have been in touch with iron for some time. Through the action of the acids in the fruit iron is dissolved, which combines with the tannin in the juice. This iron-tannin compound is soluble without colour in ciders containing a fair amount of malic acid (·5 per cent. or more), but in ciders with less acid it gets quickly oxydised by the action of the air, into a dark coloured compound, which often is precipitated in the cider.

Two kinds of apples, the Red French and Broadleaved French, very common in Herefordshire, the ciders of which are especially liable to blackening, were supplied in the autumn of 1913 by Major Caddick, Ross, with the object of trying the influence of iron upon the juices. The apples were ground in a wooden mill, and care was taken that the juices did not get into touch with iron during the making. As ciders prepared by adding a certain amount of water to the pomace and repressing suffer very much from blackening some of the apples were dealt with in this way. To another lot of the juice tartaric acid was added so as to increase the acidity to ·5 per cent. To one sample of each juice a small piece of thin iron wire was added and allowed to remain in the juices during the first three days of the fermentation. It was then removed.

The analyses of the juices were :—

RED FRENCH :	Spec. Gravity 1·050,	Malic Acid, ·24 %,	Tannin ·19 %
BROADLEAVED FRENCH :	„ „ 1·053,	„ „ ·22 %,	„ ·31 %

All the fermentations were carried out in glass vessels at room temperature and allowed to proceed normally. Fermentation started quickly in all samples, the Red French juices showing a more rapid fermentation than those of the Broadleaved French. After five weeks fermentation had stopped, and all the samples were filtered and bottled.

The particulars of the individual samples tested were as follows :—

	BROADLEAVED FRENCH.	Specific Gravity at start.	Specific Gravity when Bottled.
1.	Ordinary juice	1·053	1·033
2.	Juice diluted with 10% water and added tartaric acid to increase acidity	1·045	1·016
3.	Juice diluted with 20% of water	1·040	1·017
4.	Juice diluted with water and small piece of iron wire added	1·043	1·015
	RED FRENCH.		
1.	Ordinary juice	1·050	1·014
2.	As 2 in above experiment	1·045	1·018
3.	As 3 „ „	1·040	1·010
4.	As 4 „ „	1·038	1·005

The bottled ciders were on several occasions tested as to their liability to discolouration when exposed to the air by being poured out into glasses, which were left for several days without cover. It was always found that the two Nos. 4 (treated with iron wire) very quickly assumed a greenish colour, which in the course of about 15 minutes went dark green, later changing to blackish-green, and giving a black deposit. On the contrary, all the other samples only slowly changed their colour from the original pale yellow into a darker yellow tinge, even when kept exposed to the air for several days.

It was consequently proved that the iron was the cause of the abnormal colouring, since none of the other samples, both diluted and undiluted, which had been kept out of touch with iron, showed more than the usual darkening of colour, which normally takes place with all ciders exposed to the air, and is caused by the oxidation of the tannin.

The iron gets into the juice from the iron mill, iron shovels, and other appliances of iron used in the making. It is also possible that soil adhering to the apples in some cases brings iron in the juice.

It is consequently essential only to use iron appliances when strictly necessary, and to clean them well before and after use. It

is especially important that the juice and particles of pomace be removed when the milling is finished for the day, because otherwise the acid from the fruit mill dissolves some iron, which will get into the juice prepared the following day.

Fermentation Experiments with Plum-Juice.—Some experiments were carried out during the autumn of 1914 to utilise plums for the making of a kind of plum wine and brandy, the object being to ascertain if in years of glut unmarketable fruit could be profitably dealt with in some way of that kind. The variety of plum used was the egg-plum, of which large quantities are grown in Worcestershire. The samples were sent by Mr. G. F. Hooper, Pershore.

The juice of a sample was expressed for analysis, and it had a specific gravity of 1·040, contained 1·2 per cent. of acid (determined as malic acid), and 2·75 per cent. of sugar. Small samples of the juice placed at 25°C. gave a rapid natural fermentation. In five days the specific gravity had fallen to 1·007, the fall in gravity being principally due to the coagulation of pectic matter (plant gum), which was present in the juice in large quantities. A microscopical examination after fermentation showed the presence of an elongated yeast in large numbers, the appearance of the yeast being very similar to that of many of the yeasts found in cider.

Some experiments on a larger scale were carried out :—

(1) About 70lbs. of plums were crushed without breaking the stones. The stones were removed, and the fruit pulp pressed after being packed in cloths in a small cider press. The small press available for the purpose was a hand-worked type, and it was very difficult to express the juice thoroughly, although the press was left for two days, increasing the pressure gradually as much as possible. The resulting juice was very thick and gelatinous and the quantity obtained only about 2 gallons ; with a stronger press more juice would, of course, be obtainable.

The expressed juice had a specific gravity of 1·045, and contained ·63 per cent. of acid. To it was added a culture of a wine-yeast (No. 37) ; and it was left to ferment at a temperature of about 60° F. The fermentation started quickly, and the juice was nearly clear in a fortnight, when it was bottled. The specific gravity was 1·007. The resulting wine was very thin, but possessed a not unpleasant flavour and aroma.

(2) About 70lbs. of plums were crushed, without breaking the stones, and put into a small tub with 3 gallons of water and 5lbs. of sugar. The mixed juice had a specific gravity of 1·037, and

contained ·4 per cent. of acid. Fermentation started quickly, and in the course of three days the gravity fell to 1·032. It was then strained through cloth, and the residue, after removal of the stones, was pressed. After a further ten days the fermentation stopped; and the juice, being nearly clear, was then bottled. The specific gravity had fallen to 1·001. The resulting wine was very similar to No. 1, but of a stronger plum flavour and aroma.

(3) The stones and press-cakes remaining from the above experiments were passed through a wooden mill, whereby most of the stones were broken. To the whole mass was added 5 gallons of water and 5lbs. of sugar. It was allowed to ferment for a fortnight. The liquid was then found to be completely fermented. It was filtered through a cloth and subjected to distillation in a small still of the same pattern as is used in France for distilling of brandy from cider. The plum spirit was distilled to a strength of about proof (about 57 volumes per cent. of alcohol), and had a very nice aroma reminiscent of cherry-brandy. The flavour was not particularly good, being somewhat like freshly distilled brandy; but it will probably greatly improve on keeping. If it could be kept in wood, it would certainly do so, but unfortunately the quantity at present available is too small for that purpose.

As these plums contain very little sugar, it will be necessary, if the method comes into practical use, to add sugar to the juice, or to add sugar and water as in 2. If the method in 2 is followed the plum-wine will retain more of the plum character, because the aromatic elements of the fruit are better extracted if the fermentation is allowed to proceed for some time before pressing. If more sugar is added than in 2, the mixture ought to be allowed to ferment about eight days before pressing.

Cider Apple Jelly without Sugar—In view of the abundance of the cider fruit in 1914 and of the desirability of preventing waste of any material of food value during the war, the possibility of converting cider apples into jam or jelly was investigated in the laboratories at Long Ashton. It has been found possible to produce a very palatable jelly from suitable varieties without the addition of sugar or glucose. An attempt is being made to put the undertaking on a commercial footing and to obtain a market for the jelly.

The method is also applicable to domestic conditions, and a supply of home-made jelly can be simply and inexpensively made in districts where cider-apple juice is obtainable. Since the prices of jam and of sugar are likely to rule high for some time, particulars of the method by which a supply can be made very cheaply in the home will, doubtless, be of interest to consumers of jam.

The cider apples especially suitable for making this jelly are the sweet and bitter-sweet varieties. The sharp or sour varieties will, if used by themselves, give a jelly of too acid a flavour. They can however, be used if mixed in small quantities with the sweets and bitter-sweets.

The juice of the apple is alone required. It can be obtained from the cider press, in the usual way, and should be used as fresh as possible, and in any case before fermentation has started. It is generally desirable to strain it through a jelly-bag or piece of muslin to remove particles of pomace or any other solid matter. The filtered juice is then concentrated by boiling in an open vessel over a fire or an oil stove. An enamelled saucepan serves the purpose very well; but iron saucepans are not advised, since the juice acquires a very dark colour, from contact with the iron. A double saucepan, such as a porridge saucepan, gives better results, but the concentration takes place more slowly. In any case it is desirable to use a double saucepan for the latter part of the concentration, since a lighter coloured jelly can be obtained in that way.

When the juice is reduced by boiling to about one-sixth of its original bulk, it is poured out into jars, where it will set as a rule to a firm jelly in the course of one or two days. Some juices occasionally require a longer time to set.

Most juices will make very good jelly in this simple way; but, in some cases, further treatment is necessary to make them set. This can be done by boiling up separately a further lot of juice with a small quantity of the freshly pressed pomace taken from the cider press, and adding the extracted juice from this mixture to the previously concentrated juice. The extract is made by mixing the pomace with the unboiled juice at the rate of about one small teacupful of pomace to one quart of juice. The mixture is cooked for about half an hour. This can be done in an enamelled saucepan over a fire, if constantly stirred to prevent the pomace from charring; or it can be treated in a double saucepan or in an oven in a stone jar. After the necessary cooking the juice is extracted by squeezing through a jelly-bag, or a piece of linen or calico, and is then added to the concentrated boiling juice which requires treatment. The boiling is then continued until the latter is again reduced to about one-sixth of the original volume taken. It is then poured into jars to set.

It is not possible to give exact quantities of the amount of extract from the boiled pomace required to make concentrated juice set to a jelly, since the conditions of ripeness of the apples and other factors affect the question; but, as a guide, it is suggested that the quantity

of extract added should be about equal to that of the juice after concentration. Thus, if six gallons of juice were originally used, the quantity of extract to be added would be one gallon.

After the jelly has been poured into jars, it should be treated in the same way as an ordinary jam.

If it is desired to produce a very clear jelly, or if the juice is too bitter, it is recommended that a little gelatine should be added before straining and boiling. The gelatine must be dissolved in a little warm water before addition, and the quantity used should be about half-an-ounce to ten gallons of juice. The white of an egg mixed with a little cold water can be used in the place of gelatine, that from one egg being sufficient for one gallon of juice.

Blackberry and other fruit jellies can also be made by this method by the addition of juices of those fruits to the apple juice before concentration.

Reckoning the value of cider apples at 30s. per ton, a price higher than the average in 1914, it is estimated that the home-made jelly could be made at a cost of less than 2s. per gallon.

If, instead of boiling down to one-sixth, the concentration is stopped earlier, so that about one-fifth of the original volume is left, the concentrated juice will not set, but remain liquid as a syrup. This apple-syrup can be used with advantage to take the place of sugar-syrup when bottling fruit. As it keeps very well, it can be bottled and used, diluted with water, as a pleasant, non-alcoholic drink.

It is, of course, also possible to dilute the syrup with water and add some yeast and thus make it into cider at any moment.

Investigations on Fruit Problems.

Apple Root Stock Investigations.—Fruit growers familiar with the nursery side of apple growing are aware that, at the present day, three different classes of root stocks are used by nurserymen for budding and grafting purposes. The first group is the so-called "Paradise" class, which consists of certain types distinguished by having the following features in common: the ease with which adventitious roots are given out at any point of the plant, the surface-rooting fibrous habit of the root system, and the dwarfing effect which it has upon the growth of the variety which is grafted or budded on to

* Separate copies of the foregoing particulars respecting Cider Apple Jelly can be obtained in the form of a leaflet from the National Fruit and Cider Institute,

it. On account of this dwarfing effect on the growth, the trees are thrown into bearing at an earlier stage than is the case when the same variety is worked on one of the stronger classes of root stock. The second class of root stock is known as the crab stock, and the individual plants are derived from seedlings raised from pips taken from so-called "Crab" apples. Although at the present time there are a number of so-called "Crab" stocks used, probably very few of them originate from the true Crab apple. Most of them come from small crab-like apples found growing in a wild or semi-wild state in various parts of the country. The third class of root stock used is the free stock. These are obtained as seedlings by sowing pips collected from the pomace of cider apples in France and this country. The root systems of the crab and free stocks are much more vigorous than those of the Paradise class, showing less of the surface rooting fibrous habit, and presenting a more deeply penetrating tap root type. Instead of exercising a dwarfing effect on the grafted variety they encourage more or less strong growth and produce comparatively large trees which come into bearing less readily and later than those on the Paradise stock.

The Paradise stocks, of which there are evidently a number of types, do not present any difficulties of multiplication, being propagated either by cuttings or layers. By this means the number of plants of any one of the Paradise stocks can be multiplied indefinitely; and there is, therefore, no difficulty in obtaining any number of trees of a desired variety of apple on the same root stock, so long as a stock of the Paradise type is used. In the case of the free and crab stocks, however, the case is entirely different, since each plant has originated from a different seedling. As is well-known, if apple seeds are sown, the seedlings show great differences in habit and character owing to the fact that all existing kinds of apples are apparently of what is called a multiple origin; that is to say, they are hybrids and not fixed varieties, and therefore do not breed true. When, therefore, apple trees are procured which are worked with crab or free stock, it may be taken for granted that no two of the root stocks are exactly alike, and on that account uniform results may not be obtained.

It has already been mentioned in the previous reports of the Institute that the question of the investigation of the influence of the root stock on the tree has been under investigation. During the past season conclusive evidence has been obtained to show that the root stock is capable of exercising—in certain directions at least—an appreciable influence upon the character of the tree and the quality of the fruit. It has, therefore,

become a matter of importance to apple growers that the root stock question should be thoroughly investigated.

It has been stated above that some kinds of root stocks produce a dwarfing influence upon a tree, while others promote more or less vigorous growth, the fruiting characters being to some extent affected in the opposite direction. It is, therefore, important to ascertain what kind of root stock is the best to use for a certain variety, and also, as far as possible, how far the root stock ought to be varied according to the kind of soil on which the tree is grown.

It is with that purpose in view that the Institute, in conjunction with the Wye College Fruit Experiment Station at Malling, Kent, is undertaking an investigation of the various types of root stocks used in this country and abroad. At the Wye College Station attention is being directed mainly towards stocks of the Paradise type. At Long Ashton the work is concerned chiefly with stocks belonging to the crab and free classes. A collection of types of the various classes of stocks as used by the leading fruit nurserymen in this country and abroad has been obtained, and these types are now being classified and propagated with a view to testing the value of each in due course on certain selected varieties of market apples chosen as representatives of strong, medium and weak-growing sorts respectively.

It is already evident that the number of types of the Paradise class in general use is not extensive, and it will probably not be a matter of many years before the influence of each of these types can be thoroughly ascertained. In the case of the free and crab types the number of types is indefinite, since each individual seedling differs from all the others. In this case efforts must be directed to grouping the plants into a number of general types representing more or less clearly definite habits of growth. After this has been done, it will be necessary to select the most promising of each class for propagation, if it is found possible to propagate stocks of those classes vegetatively with success. Some preliminary work in this direction has already been done: and it seems probable that there will be no difficulty in propagating any of the selected types by means of root cuttings. Having selected from the crab and free types individuals of different degrees of vigor of growth, it is proposed to graft or bud them with the best varieties used in the case of the Paradise stocks. There will then be under trial a series of root stocks for apples representing a very wide range of vigour of growth. By this means it should be possible to ascertain more satisfactorily than has hitherto been possible the main points of root stock influence and

SUBSTANCE USED.	APPLIED.	RESULT ON JUNE 6.	RESULT ON JULY 16.
Lime 2lbs. Glue $\frac{1}{8}$lb. Starch $\frac{1}{8}$lb. Pot. Dichromate 1-64th lb. Water 1 gallon	Early in April.	Scales few and late in hatching but healthy.	Most dried up but some normally developing.
Whiting 6lbs. Glue $\frac{1}{8}$lb. Starch $\frac{1}{4}$lb. Pot. Dichromate 1-32nd lb. Water 1 gallon	..	Scales later in hatching than control but apparently developing normally.	
MacDougall's Summer Wash 1 in 50	May 28	Normal in colour and not dried up. Possibly living.	Many quite normal but others remaining at the June 6 stage and dried up.
Vistoline 1 in 100	..	Half the scales normal. The rest rather dark in colour but none dried up.	Some normal and others dried up in the June 6 stage.
Lysol 1 in 100	May 30	Only a few specimens present. Nearly all dried up.	A few dried up in June 6 stage but most developing normally.
Paraffin Emulsion 2% Paraffin 2% Soft Soap	May 28	Not many present, but most of them healthy.	The few present quite normal.
Soluble Sulphur 3lbs. in 50 gallons	May 28	Fairly normal. A few dried up.	All dried up in the June 6 stage.
Lime Sulphur 1 in 26	June 4	Many dried up.	All dried up in the June 6 stage.

the kind of stock best suited to individual varieties of apples and particular types of soil.

Summer Spraying against Mussel Scale.—In the following table the results are given from a trial of various spray fluids, mostly applied in the summer stage. In most cases two trees were treated, one badly and one slightly attached. In no case was any spray injury observed. The whiting and lime coats had been applied in the course of other experiments, but the results were observed as a part of this experiment. "Soluble Sulphur" is a powder resembling liver of sulphur, but which is, however, very much cheaper. It is made by the Niagara Spray Co., U.S.A. The two covering washes caused a later date of hatching than the controls, which hatched about the middle of May. Otherwise they did not prevent a considerable infestation. The four following appeared to kill those larvæ that were present at the time of application. The two sulphur sprays had a more powerful action. They not only killed all larvæ present when applied, but also in some way stopped others settling down as on the second examination only dried larvæ in the stage that they appeared on the controls on June 6th could be found. Their action might have been to prevent hatching or the resulting sulphur coat on the tree may have killed or warded off later hatched larvæ. At any rate they acted as a specific.

The Application of Spray Fluids to Trees in the Dormant Condition.—The subject of winter washing of fruit trees is one in which much uncertainty prevails. The number and variety of winter washes put on the market with their assertions of lethal powers over many fungus and all insects whether in the egg stage or otherwise is only matched by the paucity of detailed information of successful results. It is, indeed, a field full of possibilities, but as yet without many successful results. Spraying trees in the dormant condition has many advantages and a really successful fluid capable of killing eggs or inhibiting egg hatching would be a great asset to the fruit grower. Among the advantages may be cited the economy of fluid used owing to the leafless condition, comparative ease of obtaining labour, slackness of other work and non-interference with the subsequent busy season.

In order to test certain of the more commonly recommended non-proprietory mixtures an experiment was begun at Long Ashton in March, 1914.

For this purpose eggs of Red Spider, Larger Winter Moth, Mussel Scale, and Apple Psylla were used as tests, and the spray fluids, as under, were applied to them in the laboratory.

(1)	2%	Caustic Soda.				
(2)	3%	,, ,,				
(3)	5%	Paraffin.	2%	Soft Soap in the form of an emulsion.		
(4)	10%	,,	2%	,, ,, ,, ,, ,,		
(5)	5%	Paranaph.	2%	,, ,, ,, ,, ,,		
(6)	10%	,,	2%	,, ,, ,, ,, ,,		
(7)	2%	Caustic Potash.	2%	Soft Soap.		
(8)	2%	,, ,,	1%	,, ,,	2%	Paraffin as an emulsion.
(9)	2%	,, ,,	1%	,, ,,	5%	,, ,, ,,
(10)	2%	,, ,,	1%	,, ,,	10%	,, ,, ,,
(11)	2%	,, ,,	1%	,, ,,	2%	Paranaph.
(12)	2%	,, ,,	1%	,, ,,	5%	,,
(13)	2%	,, ,,	1%	,, ,,	10%	,,

The paranaph was made by dissolving 10 gr. of naphthalin in every 100 gr. paraffin. This liquid was then used in the same way as paraffin to make an emulsion in the soft soap. In the case of the red spider and apple sucker eggs the twigs on which they had been laid were dipped in the various fluids to be tested, drained, and left with their lower ends in water. It was necessary to cut the psylla infested twigs off the trees within a fortnight of their normal hatching period or no hatching would take place on the control. The eggs of the Great Winter Moth were laid by a late emerging female in the laboratory, and three eggs were taken for each test. Small pieces of bark heavily infested with mussel scale, then in the egg stage, but covered by the dead female scale, were used as the fourth material to be tested. Drops of the liquid to be tested were placed on the scales till completely wet after which they were allowed to drain. Similar treatment was given to the Winter Moth eggs, and both were then allowed to dry, and subsequently placed in covered watch glasses.

The results are included in the two following tables :—

Results on April 2.

Nos. 1, 2, and 7—13 contained 2 or more per cent. of caustic potash or soda, and all caused shrivelling of the eggs of the Larger Winter Moth. These washes also seemed to have some effect on Red Spider eggs, but not a very marked one. Red Spider proved themselves very resistant to any wash. None of the washes completely stopped hatching of the psylla except No. 13, which (see subsequent table) killed the whole shoot as well.

In the above table, which represents the final observations, it will be noticed that all the fluids tried prevented hatching of the eggs of the Large Winter Moth, which thus seem very sensitive. The Red Spider eggs proved resistant to all. The same applies to the Apple Sucker, except as regards the 3 per cent. caustic soda, which

WASH.	LARGE WINTER MOTH.	RED SPIDER.	APPLE PSYLLA.
1	Eggs shrivelled.	Not hatched. Shoot dormant.	Not hatched. Shoot dormant.
2	" "	2 eggs hatched. "	" " Eggs turned brown.
3	Eggs slightly flattened but healthy.	Fair numbers hatched. "	Hatched in numbers. Buds bursting.
4	" " " "	1 egg hatched. "	" " " Buds open.
5	Eggs healthy, unhatched.	Hatched in numbers.	No eggs on shoot.
6	1 egg flattened, 2 healthy.	None hatched. Buds bursting.	Many hatched.
7	Eggs shrivelled.	1 hatched. Shoot dormant.	Few hatched. Buds well open.
8	" "	1 " " "	" "
9	" "	1 " " "	Fair number hatched. Flowers nearly open.
10	2 " " One healthy.	Many " Shoot in leaf.	Few hatched. Buds open.
11	Eggs shrivelled.	1 hatched. Shoot dormant.	Fair number hatched. Leaves out.
12	" "	Fair number hatched.	Few hatched. Leaves out.
13	" "	1 hatched. Shoot dormant.	Fair number hatched. Leaves out.
Control	Not hatched.	Hatched.	Hatched.

Wash.	Large Winter Moth. Observed April 9.	Red Spider. Observed April 9.	Apple Sucker. Observed April 9.	Mussel Scale. Observed May 5.
1	Eggs shrivelled.	Many hatched.	Negative result (due to lack of enough eggs).	A few hatched.
2	,, ,,	,, ,,	Shoot and eggs killed.	Many ,,
3	Crinkled. Not hatched.	,, ,,	Hatched.	Few ,,
4	One crinkled. None hatched.	,, ,,	,,	Many ,,
5	3 crinkled. None hatched.	,, ,,	Absent.	,, ,,
6	1 ,, ,, ,,	,, ,,	Hatched.	,, ,,
7	Eggs shrivelled.	,, ,,	,,	None ,,
8	,, ,,	,, ,,	,,	,, ,,
9	,, ,,	,, ,,	,,	Very few ,,
10	,, ,,	,, ,,	,,	None ,,
11	,, ,,	,, ,,	,,	Very few ,,
12	,, ,,	,, ,,	,,	None ,,
13	,, ,,	,, ,,	,,	,, ,,
Control	All hatched.	,, ,,	,,	Hatched in numbers April 29.

killed both eggs and shoot. The mussel scale was most influenced by those fluids containing caustic soda or potash, which greatly reduced or entirely prevented hatching. It must, of course, be borne in mind that these results were obtained indoors, and that under field conditions where the caustic alkali would be speedily washed away very different results might be obtained.

Treatment against Woolly Aphis.—Woolly Aphis of apples does great damage to nursery stock in many fruit growing districts, especially on light soils. The remedies so far advised are unsatisfactory in that they must be constantly repeated throughout the summer in order to keep the pest down. While its life history in England is not yet certain it is difficult to know in what stage to attack it, but it seems certain that migration from the root is the cause of much of the summer infestation, though a possible migration from the elm cannot be ruled out till the point has been satisfactorily proved one way or the other for English conditions. The following experiments were designed to test certain soil insecticides, but as the results were negative they will be only given in brief.

Four rows of nursery cider trees, well separated from each other, and containing twenty-four trees per row, were experimented on. No. 1 was treated with a solution of potassium thiocarbonate at the rate of 30 gallons of water to 14 oz. of the thiocarbonate. No. 2 had injections of 24 oz. of carbon bisulphide in equal doses at about a yard distant from each other. No. 3, had a solution of carbon bisulphide containing 24 oz. in 100 gallons of water applied to the soil, and No. 4 had injection of toluene amounting to 24 oz. in one ounce doses, similar to No. 2. In none of the four cases could any sensible diminution of attack in the summer be observed. No. 1 was applied in the middle of May, and Nos. 2—4 in the middle of April.

Treatment against Wireworms.—Against wireworm many treatments have been advocated and from their number the conclusion may be drawn that none are strikingly effective. With its hard cuticle, its underground habits, and its powers of migration, it avoids all the usual methods of killing insects. Its voraciousness and its catholic taste make it both exceedingly harmful and difficult to control by cultural means. It is, indeed, supposed to attack every plant except mustard. The damage it does to crops planted on freshly ploughed or dug grass land is sometimes excessive, and generally great. Farmers and gardeners suffer alike.

Most of the customary preventive measures may be found in the

Board of Agriculture's leaflet on the subject. It seemed desirable, however, to test some of the hitherto recommended soil insecticides and any others that could be thought of, under laboratory conditions, where the results can be better controlled.

The method used was as follows. Four or five wireworms were placed carefully in moist but not wet earth in beakers whose superficial area was 1-100th square yard, and whose depth was about five inches. This is admittedly an artificial method as the larvæ cannot escape except from the top, which they never do, and the depth does not correspond to the average cultivated depth of a field.

Of the easily vapourisable liquids, oil of mustard, petrol, carbon disulphide and oil of mirbane were tried. In these cases the liquid was placed at the bottom of a clean beaker then earth quickly added, filling the beaker up to three-fifths, and lastly the wireworms were laid on the earth, and more earth added till the beaker was full.

Of all the fluids tried oil of mustard proved the most deadly, and this is to be expected from the good results known to follow from digging or ploughing in a crop of mustard. It is, however, far too expensive.

The other noticeable thing in the table is the failure of carbon bisulphide even at strengths which would be prohibitive in cost. A possible explanation for this fact is ventured after the consideration of the table showing results from slowly volatile substances. These require some days for their complete effect, and are characterised by a slow continuous evolution of poisonous vapour. Those used were vaporite, naphthalin, a mixture of lime and paraffin, and a mixture of ammonium sulphate and lime.

The mixture of ammonium sulphate and lime, which showed promise in preliminary experiments, failed to give good results. The same was the case with lime and paraffin. It would, besides, be of questionable advisability to add much paraffin to the soil owing to its very slow escape therefrom.

Vaporite at ½ gr. per beaker, or 1 lb. per 8 square yards, a quantity recommended by the manufacturers, gave fair results, but much better results were got by using half the weights of crude naphthalin, a result, too, obtained at about one-third of the cost.

Reviewing the whole experiment, the superiority of crude naphthalin is the most noticeable thing. Carbon disulphide gave disappointing results. In practice this material is awkward to deal with as its dangerous nature, and consequent high price through cost of carriage, is against it, and it has been found by many observers to be very capricious in action. Its failure to kill may have been

SUBSTANCE.	NO. OF LARVÆ.	EXAMINED AFTER.	RESULT.			AMOUNT PER SQ. YD.	COST PER ACRE.
			Dead.	Missing	Living.		
Oil of mustard							
1 drop	5	2 days	4	1	0	1-6th oz.	£12 10 0
½ drop	4	4 days	0	1	4	1-12 oz.	£6 5 0
Carbon disulphide.							
1 drop	5	2 days	1	1	3	1-6th oz.	£2 0 0
2 drops	5	2 days	0	0	5	1-3rd oz.	£4 0 0
4 drops	4	1 day	0	0	4	⅔ oz.	£8 0 0
Petrol 4 drops	5	?	1	1	3	⅔ oz.	£2 5 0
Oil of Mirbane.							
2 drops	5	2 days	0	1	4	⅓ oz.	£0 17 0
3 drops	5	4 days	0	0	5	½ oz.	£1 5 6

Substance.	No. of Larvæ.	Examined After.	Result.			Amount Per Sq. Yd.	Cost per Acre.
			Dead.	Missing.	Living.		
Am. sulph. and fresh slaked lime ·25 gr. am. sulph. 5 gr. lime	5	2 days	2	0	3	1½ oz.	£5 0 0
·5 gr. am. sulph. 5 gr. lime	5	2 days	0	0	5	2 oz.	£6 0 0
·6 gr. am. sulph. 5 gr. lime	5	2 days	2	1	2	2¼ oz.	£6 15 0
Paraffin lime xs added	2	2 days	2	0	0		
20 gr.	4	5 days	1	0	3	72 oz.	£9 0 0
Vaporite ½ gr.	5	2 days	3	0	2	2 oz.	£2 10 0
Ditto	3	3 days	2	0	1	2 oz.	£2 10 0
Pure naphthalin ¼ gr.	4	7 days	4	0	0	1 oz.	?
Crude naphthalin ¼ gr. diluted with same quantity slaked lime	4	5 days	3	1	0	1 oz.	£0 19 0
Ditto, but larvæ placed at bottom of beaker and naph. 3-5ths up the beaker	4	4 days	0	1	3	1 oz.	£0 19 0

due to its high volatility. Wireworms are extremely resistant to harmful influences, and they can apparently survive the vapour if not in prolonged contact with it. No smell of it could be observed in the beaker after a day, while the naphthalin vapour could be smelt for nearly a week. It is, perhaps, owing to its slow action that naphthalin is successful. The last experiment shows that naphthalin vapour does not penetrate downwards, and must in practice be dug in fairly deeply.

At twice the strength, namely, 2 oz. per square yard, it has been tried outside. While it is exceedingly difficult to judge of the efficacy under these conditions, in the author's opinion it considerably lessened if it did not entirely stop attacks by the larvæ on a certain piece of garden land.

Experiments on Big Bud Mite.—Of methods of combating this mite in the migratory stage there are at present only two. One, that of dusting the foliage with mixtures of lime and flowers of sulphur, entails danger of burning the foliage, while the other, consisting of repeated applications of soft soap and quassia mixture, is exceedingly laborious. Both have given unsatisfactory results when used by growers though some successes are claimed.

The idea of covering the bushes with a sticky substance during the migratory period was suggested to the author, and accordingly trials were made to obtain a satisfactory fluid.

The conditions to be fulfilled were as follows :—

(1) It must be capable of being applied through a spraying machine.

(2) It must leave a sticky coat when dry that will remain so for a month at least.

(3) It must be non-injurious to the bush.

(4) It must not be more than moderately expensive.

These conditions are difficult, and it may be stated at the outset that all have not been satisfied.

After some preliminary trials in the laboratory an emulsion of a mixture of 10 per cent. vaseline and 10 per cent. boiled linseed oil in 1½ per cent. soft soap was found the most satisfactory.

This mixture, while warm, was sprayed on to sixteen black currant bushes on April 14. It was found, however, that the addition of boiled oil caused a too quick drying, and on April 29 a 20 per cent. emulsion of vaseline in 1½ per cent. of soft soap was applied to eight of the last sprayed bushes, and to six fresh bushes. More bushes were sprayed with this mixture on May 11, and half those treated on April 29 were re-sprayed.

Those twice sprayed on April 29 and May 11 showed, as was to

be feared, a considerable amount of defoliation. The sticky coating was fairly good, but the process was difficult owing to the quantity of foliage present. In the winter all the treated bushes showed less big bud although control bushes were as bad or worse. The greatest reduction was found in those that had been twice sprayed on April 29 and May 11, but these had also suffered the most from defoliation. The difference was, indeed, striking, the attacks having been reduced to approximately one-third of the previous amount.

This method is not regarded as satisfactory as the liquid is not easy to apply and considerable defoliation resulted, and also some amount of dead wood, but the results are given in order to show the possibilities if a satisfactory sticky coating could be devised.

Miscellaneous Investigations.

Investigations on Tobacco Soils.—In view of numerous experiments on tobacco growing, now in progress throughout this country, and of their special interest to fruit growers as leading to a possible supply of cheap and home-grown nicotine for spraying purposes, the following account of an investigation of a series of samples of American and African tobacco soils carried out at Long Ashton last season is here included, although the subject is somewhat outside the general scope of the work.

The American samples were taken from soils which had long been under cultivation for tobacco, and were known to produce excellent crops of good quality: the African samples, on the contrary, were from virgin soils only recently brought into cultivation which had grown at the most two crops of tobacco. The problem was to determine by a comparison of the American and African soil types in what particulars they differed from or resembled one another, and, if possible, to draw conclusions as to the likelihood of the African soils growing tobacco of similar quality to that grown on the American soils. The essential details from the report which was prepared are given below.

The following samples were received :—

American.

1. *Wilson, N. Carolina.* Almost white coarse sand ; faintly acid.
2. *Darlington, S. Carolina.* Almost white coarse sand ; acid.
3. *Danville, Virginia.* Yellowish coarse sand ; acid.

AFRICAN.

1. *Amika Estate, New Clearing No.* 5 *Exten.* Dark-red rich-looking sandy soil; acid.
2. *Nachamba, Amika Estate (Old).* Similar to 1, but darker; neutral.
3. *Ntondwe Estate.* Dark soil, probably long in cultivation; neutral.
4. *Tekerani Estate (Old).* Black soil; faintly acid.
5. *Makoka Valley Estate.* Dark red, like 2; acid.
6. *Tekerani Estate (New).* Exactly like 4.
7. *A. Duvar, Ntondwe.* Exactly like 3.
8. *Amika Estate.* Exactly like 1.
9. *Amika Estate (New).* Like 1 and 8.
10. *Amika Estate.* Like 1 and 8.
11. *T. M. Partridge: Hombera Garden.* Black soil; acid.
12. *T. M. Partridge: Froub Garden.* Dark soil similar to 11.
13. *T. M. Partridge: Lunzu Garden.* Black soil; faintly acid.
14. *Nasengwe: Garden* No. 1. Red soil; acid.
15. *Nasengwe: Garden No.* 2. Black soil; much undecomposed organic matter; acid.
16. *Nasengwe: Garden No.* 3. Black soil like 13; neutral.

After testing all the samples and making a preliminary examination, the following were selected, as representative of the various types, for more thorough investigation and analysis :—

American. Nos. 2 and 3.

African. Nos. 2, 3, 5, 6, 9, 13, 14 and 15.

(1) The results of the analyses are set out in the accompanying table. It is evident from the figures that the American soils (which are all of one type) differ essentially from the African soils, although the latter, naturally, vary considerably among themselves. In the first place, the African soils are all dark-coloured (dark red or black), whilst the American are very pale; but the most important distinction lies in the higher percentages of plant food found in the African soils. Mechanically, the soils are all very sandy, the American even more so than any of the African, though the differences here are not so marked.

The only particular in which all the samples agree is in their uniform lack of more than traces of carbonate of lime.

(2) *The American soils* as a group may be described as very coarse-grained sandy soils of feeble water-holding capacity, and poor in all the elements of plant food. Judging from the analyses it seems probable that on these soils the tobacco crop must be

supplied with large quantities of readily available artificial manures (such as sulphate of potash, superphosphate, sulphate of ammonia, etc.), and this treatment would explain the rather high ratio which the available potash and phosphoric acid bears to the total amount present. It is known to be a better plan in America to bring a poor piece of land of a sandy nature into a proper state of fertility by the use of fertilisers than to grow the crop on richer but heavier soil.

(3) *The African soils* on the other hand are sandy soils of good water-holding capacity (on account of the high percentage of organic matter) and well supplied with all the elements of plant food. It is probable that these soils at present need no extra fertilising, although, since tobacco makes specially heavy demands on the potash present, the crop would possibly respond to dressings of sulphate of potash. If, however, the soils are cropped continuously without manure of any sort they will no doubt approximate more and more to the condition of the American samples.

(4) The chief differences may be expressed as follows :—

Compared with the American soils, the African soils

(1) are much darker in colour ;
(2) contain much more organic matter (humus) and nitrogen ;
(3) contain more phosphoric acid and potash ;
(4) contain rather more of the finer grades of soil particles.

It appears probable that these American and African samples differ essentially in that, in the one case the plant food (especially the nitrogen) must be supplied in the form of readily available artificial manures whilst, in the other it can be obtained, in somewhat different form, from the natural reserves of the soil.

Therefore, even if the possible effect of differing climates and rainfall is set aside, there are many points of difference between the two groups of soils, any one of which may have an important influence on the quality of the crop.

Notes on Teart Land.—Problems in connection with the scouring or "teart" land have received a considerable amount of attention during the last few years, and since the appearance of a paper on the subject in the *Journal of the Board of Agriculture* in October, 1910, the work has been carried somewhat further. A paper dealing with this later work has recently been published in the *Journal of Agricultural Science* (Vol. VI., p. 328), entitled "The Scouring Lands of Somerset and Warwickshire," and the main points are here summarised.

It may be said by way of introduction that the scouring lands referred to are certain areas of old pasture which, at some

PERCENTAGE OF AIR-DRY SAMPLES.

	American.		African.							
	2	3	2	3	5	8	9	13	14	15
Moisture	0·85	0·86	5·51	2·83	1·77	2·13	5·6	3·58	4·39	5·2
Loss on ignition	2·82	1·48	8·84	9·43	5·75	7·27	10·16	4·66	4·72	7·32
Potash (Total)	0·089	0·082	0·253	0·142	—	—	0·268	0·45	0·185	0·103
Potash (Available)	0·015	0·023	0·027	0·031	—	—	0·038	0·016	0·019	0·012
Phosphoric Acid (Total) ..	0·116	0·085	0·227	0·289	—	—	0·217	0·112	0·097	0·076
Phosphoric Acid (Available) ..	0·072	0·049	0·079	0·112	—	—	0·085	0·084	0·048	0·063
Carbonates	nil	nil	0·04	0·08	—	—	trace	nil	nil	nil
Gravel and Sand	88·8	80·6	62·0	66·8	74·2	74·0	60·0	76·8	—	—

EXPLANATORY NOTES.

Moisture. The amount of moisture retained by a sample of air-dry soil is dependent chiefly on the percentage of finest particles (clay) and of organic matter.

Loss on Ignition. This is a measure of the amount of organic matter present, and is, at the same time, approximately proportional to the amount of nitrogen present.

Total Potash and Phosphoric Acid. These two constituents of the soil, together with nitrogen, are the most important plant foods. The total figures give the percentages soluble in strong acid.

Available Potash and Phosphoric Acid. This is the percentage soluble in 1 per cent. citric acid, and is an approximate measure of the amount readily available for the plant.

Carbonate of Lime. A fair proportion of this constituent is essential for the growth of most cultivated plants. Tobacco is, however, known to be intolerant of large amounts.

Fine Gravel and Sand. This gives an approximate measure of the mechanical condition of the soil.

times of the year—particularly the Spring and Autumn of wet seasons—grow herbage which causes cattle feeding on it to become very ill owing to violent scouring. Cows in-milk are the worst sufferers, and great care has to be taken in the affected districts to keep any animals of weak constitution away from these fields.

The three suggestions most frequently put forward to account for the phenomena of scouring are (1) a bad water supply, (2) the presence of one or more particular species of plants in "teart" pastures, and (3) the presence of a specific organism. It is easy to show that neither of the first two of these suggestions can be substantiated. With regard to the third, it is true that at first glance there seems much evidence in favour of the view that the scouring is a definite disease due to a specific organism. All attempts to isolate a responsible organism have, however, proved useless; and, indeed, a further examination of the facts renders this biological theory of the origin of scouring highly improbable.

The existence of such land outside the county of Somerset was not for some time known to the writer, although many enquiries had been made. It is now, however, found to occur in Warwickshire, showing precisely the same phenomena under precisely the same conditions. The most striking fact in this connection is that all the scouring pastures in both counties are situated on the same geological formation—the Lower Lias; and further that the scouring districts occur only where this formation is not covered by Drift, *i.e.*, where the soils actually originate from the Lower Lias. The typical soil is an extremely heavy, sticky clay, and previous work had suggested strongly that it is the particular *physical condition* of these soils affecting the herbage that is at the bottom of the trouble. At all events the primary cause of the scouring is in some way closely associated with the soils.

In many cases scouring and sound fields lie closely adjoining, and it can then be readily observed that there is a marked difference in the texture of the surface soil in the two fields. In order to investigate further this difference, determinations of the density of some of the soils *in situ* have been made.

To obtain the soil density, small metal boxes (accurately 2 inches square) with removable top and bottom were used; and by taking a number of samples, the average weight of 8 cubic inches of the surface soil *in situ* could be obtained.

The greatest possible care was taken to procure all the samples in precisely the same manner; and fortunately for this purpose all these soils are almost entirely free from stones.

It was found that a sufficient degree of accuracy was obtainable

by this method; and Table I. gives the figures for the densities in a number of cases.

In spite of some irregularities, it will be seen that the difference in texture between "teart" and sound land is reflected in the figures for the densities; these show, with sufficient consistentcy, a definitely lower density for the surface soils of the sound fields.

The contrast between these types of soil was also well illustrated in one or two cases by their respective hygroscopic properties. The samples in one locality were taken on November 9th, 1911, when some heavy but not continuous rain had fallen after the long drought of the summer, and the ground was not thoroughly soaked. The difference in apparent "wetness" between the soils of the "teart" and sound fields was so marked that it was difficult to believe that the same amount of rain had fallen on each. The soil of the sound field seemed dryer and was hard enough to make it difficult to get the samples, whilst the "teart" soils could be moulded with the fingers. Actually the percentage of moisture was distinctly *higher in the sound soil*, the mean figures for five samples in each field being :—

Sound, 31·2 per cent. moisture,
Teart, 25·8 ,, ,, ,,

The sound field in this case has no surface deposit of alluvial soil; its history differs from that of the surrounding pastures (all more or less "teart") only in the fact that, years ago, it was drained by open "cuts." The effect of this surface drainage is the only possible explanation of its superiority.

Similarly, in another district, where the sound fields lie at a lower elevation, are often flooded in winter and are covered by a thin deposit of alluvium, the mean figures for moisture were: sound, 33·27 per cent.; teart, 31·8 per cent.; the sound soil being again *apparently* dryer than the other.

TABLE I.

Locality	Wt. dry soil in 8 cub. in. in grams		Density	
	Teart	Sound	Teart	Sound
Queen Camel	160·0	114·5	1·22	0·871
Kingsdon	123·3	100·9	0·94	0·769
Pylle	128·2	106·1	0·98	0·809
Podimore	134·7	103·5	1·03	0·789

Six samples were taken in each field and the mean figures are given.

Such physical differences between soils as are here indicated might be due to a difference either in the proportions of the various sizes of the ultimate particles, or in the arrangement of the temporary aggregates and compound particles. In the former case, the results of mechanical analyses of the soils should provide the explanation. A considerable number of mechanical analyses have therefore been made. These show that both scouring soils and neighbouring sound soils are of the same type, and the observed differences in physical condition and texture cannot, therefore, be accounted for by referring them to the ultimate mechanical compositions of the soils.

These analyses have, however, brought out the fact that, in any pair of neighbouring fields there is, invariably, a higher percentage of organic matter in the soil with least tendency to cause scouring. This has been found to be generally true throughout the whole "teart" land area. Now the proportion of organic matter here unquestionably plays the most important part in the arrangement of the temporary aggregates and compound particles, and hence to a great extent determines the texture of the soil.

Since, therefore, the only persistent difference observable between sound and "teart" soils lies in the textures, it is justifiable to consider *the special texture of the soil as a leading factor in determining "teartness."* If this is correct, "teartness" would be expected to disappear when the soil texture is improved; and field experiments are needed to test the practicability of methods of improvement which suggest themselves if this view be accepted. There is, indeed, already a certain amount of evidence available which points in this direction. For example, "teart" pastures when ploughed up and resown after a few years only slowly become "teart" again. Then, the effect of *surface* drainage is well shown in the case discussed above; and similar but less striking results have been effected elsewhere, though "teart" pastures do not as a rule lie wet.

Consideration of all the facts seems to render inevitable the conclusion that the texture of the soil plays the determining *rôle* in the production of scouring herbage.

The question then arises as to how the soil texture can affect the physiological properties of the herbage in this manner. There must certainly be a difference in the proximate constituents of grass from sound and scouring fields. The expressed juice and both fresh and dried material have been examined; but chemical analysis has so far failed to bring to light any substance to which the scouring properties could be attributed. This is, perhaps, not surprising in view

of the difficulty of getting a really representative sample of the fresh material—a difficulty which is enhanced in the present instance because there is no means of knowing how far the herbage from different parts of the same field may vary in scouring properties. The facts, however, all point to the conclusion that scouring is due to the physiological action of some constituent or constituents of the herbage which are not normally present but only occur under special soil (and weather) conditions; and further that the soil conditions are determined by the texture and can be removed when the texture is appropriately changed.

XVII.—THE 1915 SHOW AT WORCESTER.

By Thos. F. Plowman, Secretary and Editor.

The Society's Annual Show will be held at Worcester, on May 20, 21, 22, 24 and 25, the Council having resolved that, notwithstanding the exceptional conditions prevailing owing to the War, it was desirable that the Show should take place as originally arranged.

This conclusion was arrived at mainly on the following grounds:—

(1) That the principal object of the Show being the advancement of the Nation's greatest industry and the encouragement of enterprise in its pursuit, it was desirable to maintain, if possible, the continuity of its existence, even at a time of unusual stress and strain.

(2) That if the Show were not held, Stock-breeders would be deprived of a very valuable medium for bringing under public notice the animals which, under any circumstances, they must maintain in good condition with a view to the future. At the same time, implement makers and manufacturers of agricultural appliances, feeding-stuffs, fertilisers, etc., would suffer from lack of opportunity to exhibit the results of that inventive skill and commercial acumen, which have done so much for agriculture in the past.

(3) That the Herefordshire and Worcestershire Agricultural Society, in alliance for the year with the Bath and West Society, very strongly urged upon the Council the desirability of holding the Show.

(4) That the Worcester Local Committee also favoured the holding of the Show under such modified conditions, with respect to their financial responsibility, as the Council felt justified in acceding to.

The opinions expressed since the decision was made, and which have been endorsed by the principal Breed Societies, as shown by their liberal contributions to the Prize List, lead to the conclusion that the course pursued meets with the approval of agriculturists generally.

In view, however, of the additional expenditure involved in holding the Show at a time when the cost both of labour and material is abnormally high, the Society needs all the support that can be accorded to it at this juncture. Therefore the Council ask the good offices of the members in strengthening its ranks by inducing others to join them.

The Note-Book.

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Better Cultivation of Arable Land.—The cultivation of arable land is by no means a simple matter. Quite half the land in the country is indifferently farmed, yet it is easily possible to raise the output of corn and roots by one third, and of meat by one half. A writer in the "Board of Agriculture Journal" for September, 1914, says: "There would appear to be various reasons for such neglect. It may be that in some instances a farmer fears that manifest improvement of the productive capacity of his land would result in a rise of rent, but, even if this result should follow, the profits of the improvement are generally well able to bear a substantial rise." When a writer in an official journal takes it as the ordinary course for a tenant's rent to be raised on his own improvements, what wonder that men refuse to farm well? I think it pays to run the risk, because most landlords are honourable men; but it is a risk, and therefore the country is not farmed as it could be. Land clean and in high fertility is worth three times the rent of the same land when foul and poor; but this condition can only be attained by heavy outlay. There has not been sufficient inducement for men to put their best into the land. It is quite possible for a man to devote three of the best years of his life, working without any profit, and often sinking capital, in order to get a filthy arable farm into a paying state of cultivation. He has no security for this, and as an agricultural valuer, I have never been able to get a tenant sufficient compensation for good farming.

The first step towards high cultivation is to see that the land is adequately drained. Without this, seed, manures, and labour are absolutely thrown away. If the landlord will neither drain it nor give the tenant such terms as to make it worth his while to do so, far better to sow the land down with cheap seeds and improve it into useful turf by artificial manures. The next most important consideration is that the land shall be free from weeds. Land cannot grow two crops at once, and it is impossible to make arable land pay unless it is clean. The third matter of importance is to raise the condition by the use of sheep-folding, farm-dung, and artificial manures, so that it will bear maximum crops. The last great factor in high farming is to cultivate

well and deeply, so as to aerate as much of the soil as possible, so that a good seed-bed is assured, and to be always so forward with the work that everything can be done under the best possible weather conditions. I do not propose to discuss draining. The clearing of land is, however, a very large subject. When we speak of land being foul we usually refer to those weeds that are propagated by root as well as seed, such as couch-grass, thistles, coltsfoot, and any the roots of which are a hindrance to the working of implements. Although a dead fallow should never be needed after the first few years of occupation, yet on stiff soils it is the cheapest way of dealing with much couch-grass. But there must be no half measures. To lose a year's rent and rates, and all the labour, without cleaning the land thoroughly is the height of folly.

To start, one has the choice of ploughing and cross-ploughing, or of using the steam cultivator, and the latter is incomparably the cheaper. It is far better that the cultivation should not commence before March, as it is undesirable to have the land exposed to winter's frosts so as to reduce it to a crumbly state. After the first breaking up by the cultivator, it sometimes requires a heavy rolling, so that the ploughs will run evenly, but if the clods are not too large the ploughs may follow the cultivator.

The use of scuffles and harrows rather tends to work the land too fine, and to leave the under-surface moist, so that the roots can survive. Turning over with the plough so that the whole of the soil is kept dry is the surest way of making a clean fallow. The clods must not be too large, the ideal state being to keep most of the soil in lumps about as large as one's fist. But the land must be kept upon the move. One can never rely upon the whole of a summer being dry, and the best use must be made of any fine spell. As a rule, the best fallows are made before hay-time. If the land can lie for a few weeks at the end of the summer any live shoots will show. The few fragments can be forked out, and there is no time when forking is so well repaid, as every blade can be seen. After stiff land has once been cleaned it can be kept clean by the use of steam cultivators on the stubbles immediately after harvest, or occasionally by a bastard fallow after the first mow of clover. When the clover plant is only worth standing for a first crop this is the best way of dealing with it, but if the plant is strong and the field clean it is better to take the aftermath crop also. Wherever possible, stiff land is worked cheaper by steam than by horses.

On light soils the stubbles can be worked by horses with modern spring-tined cultivators, and this is the cheapest method.

No matter how foul a field may be, it can be so cleaned in time for a turnip crop, any fragments left being dealt with by the horse hoe. The only way is to make the land thoroughly clean as soon as possible; for the cost of working a clean farm is not half as great as the cost of one in which there is always enough couch to keep breeding fresh trouble. One of the most common faults in cultivation is to get land nearly clean and then to spoil the result by not completing the work.

The cheapest way of dealing with annuals is to choke them by bulk of crop. For this reason manure is cheaper than hoeing. No cereals ought to need hoeing except upon very light soils, for, if the crop is only good enough, few varieties of weeds will seed before harvest-time. But when one takes wide rowed crops, such as roots, peas and beans, the hoeing should be so thorough that not a weed is left to seed. Every time that the surface is moved and made fine, a fresh lot of weed seed is germinated. This may be killed by frost as charlock in wheat, or smothered by the crop as in cereals of any kind, or killed by persistent hoeing as in roots. But if none are allowed to seed, this constant destruction of seedlings will soon rid the land of annuals. When, from any cause, one has only a half crop, with the other half weeds, it should be mown green for hay, and the land broken up at once. To allow such a crop to ripen is suicidal. One such seeding of weeds will mean years of expense out of all proportion to the value of the half crop which the owner refused to sacrifice. When such annual seeds have been shed upon the land it is better to harrow first, so as not to cover them too deeply, and wait until the rain has germinated them before ploughing. This applies more particularly to light soils; on strong land the advantage lies with breaking it up as soon as possible after harvest and getting the soil baked.

There are a few weeds, such as docks, which may have to be dealt with by the fork, but practically all the rest can be kept in check by the measures above indicated. Where there is much arable land there should be no hedges, as not only do they harbour birds to prey upon the corn, but the hedge bottoms are a nursery for all kinds of weeds. Where there are hedges the land should be cultivated close up to them, the scythe, and the slash immediately after harvest, should be used, and every care taken to keep the headlands clean. It is cheaper to have a yard or two of fallow all round a field than to allow the rubbish to spread from the hedgerows. We must not lose sight of the danger of sowing weeds with our seed. One advantage of changing seed from heavy land to light, and *vice versa*, is that any weeds brought in the seed will not survive.

The question of manuring is one of paramount importance. On light soils sheep will always be the chief manurial agent, because they thrive best there and the crops benefit by being consolidated. But sheep are often run on arable land far too strong for the purpose, and this is a huge mistake. Not only is such land unsuited for growing swedes and catch-crops, but it is often poached so as to seriously damage the succeeding cereal. It is far cheaper to keep such land in condition by the use of artificial manures. On the mixed farms of the Midlands, where the proportion of pasture is two to three times as great as the arable, the quantity of farm dung made is so great that much less artificial manure is required than in purely arable districts. Anywhere in the vicinity of London there is a steady demand for hay and straw. The stacks are for the most part bought by auction on the farm, the dealers doing the whole of the trussing and carting. It never pays to make straw into dung where there is a sale for it, but when most of it is sold off the artificials bill should be heavy. In arable districts, such as the Wolds of Lincolnshire or the Downs of the Southern Counties, remote from markets, most of the straw has to be consumed or trodden down. One of the very best farmers in the South-East, who has fed bullocks in yards all his life, has recently taken to selling straw and replacing the dung by artificials. He assures me that he is a great gainer by the change. All arable land is better for a dressing of dung once in six to ten years, as it is an aid to the working of the soil and the conservation of moisture. When distance and hills make this impossible and the land is too heavy to grow roots for sheep, the only resource seems to be to apply artificials heavily, seed down for two to three years, and feed off with plenty of corn.

It is a mistake to put on heavy dressings of dung, say 20 tons per acre for roots, as is often done. It is far more economical to apply half as much and supplement with artificials to suit the particular crop. Manure should be made in covered sheds as far as possible, and carted direct to the land. The waste by soakage and fermentation when it is collected into large heaps is appalling, unless much more care is given to the heap than is usual. The cost of carting and spreading dung is so great that concentrated manures are much cheaper, although both are needed. The exact value of each kind of artificial can only be discovered by direct experiment on the farm. The use of phosphates is usually well repaid by the legumes, basic slag being the cheaper form on most strong soils and superphosphate upon the sands and chalks. Potash is rarely required on strong soils, except for clover and roots, but on light land it is not used as much as it should be.

All the cereals respond best to applications of phosphate combined with nitrogenous manure. The quantity of manure should always be as great as the crop will be likely to benefit by. The question for the farmer should always be: "Will this crop benefit by more manure?" not "Will it do without?" The expenses, of rent, rates, cultivation, seed, and harvesting, are nearly as much on a three-quarter crop as a six-quarter, while the addition of a little extra manure may assure the profit.

To a business man only maximum crops all over the farm are admissible. Where manures are applied freely the crops are large, and there the land is clean. There is a limit to the condition of land for the growth of cereals. The most profitable way to grow mangels is to keep them on the same field every year, as after a short time they need practically no weeding, and the condition of the land can be raised higher than would be possible if grain crops were to follow.

On easily worked soils the four-course system, or some slight variation of it, is the best, but on stiffer land we may cling too closely to old rotations. Many things are possible now which were not before we had such a choice of cheap artificial manures. Stiff soils are much more suited to the growth of wheat than any other crop. Without saying that it should be grown continuously as at Rothamsted, and as Mr. Prout did at Sawbridgeworth, still wheat could be grown profitably for several years in succession, and sufficient change could be given by an occasional crop of beans or clover. I have one friend in the south whose farming ought to be more copied. He uses the cultivator as soon as any harvest is cleared and breaks up the whole of the stubbles except where there is clover. On his chalk subsoil the land breaks up fairly fine, and by following with the drag harrows he is able to sow most of it without ploughing. He sows winter beans, winter oats, and wheat, and has no work in the spring except putting in his roots. He sells most of his wheat straw, clover hay, and meadow hay, and replaces with artificial manures. His chief means of making dung is a large dairy of cows. The farm is absolutely clean, and the crops reach a high average. The use of steam saves the keep of at least four horses and two men, so that the work is done at about half the usual cost. One great advantage of this system is that the land is only worked when dry, and the tilth obtained gets better each year. On stiff land winter ploughing is often done when it is so wet that the texture of the soil is injured for years.

Spring corn seems to get more risky each year. Those who study the Government Crop Reports each month cannot fail to notice how

often barley and oats are put down "light." Work on the land is not so costly during the dry autumn as it is in the depth of winter, and it should be an invariable rule to get everything possible done immediately after harvest. Ploughing is, as a rule, too shallow. Even those who fetch the land up deeply once in a while hesitate to plough down dung or clover. The loss of manurial value by drainage has been much exaggerated, and except in the case of such a soluble manure as nitrate of soda is almost non-existent. The only excuse for shallow ploughing is a shallow soil. I rarely plough less than six inches, and often far more. It may need an extra horse, but the crop well repays it. To have seven inches of soil and to only use the top four is equivalent to locking half one's capital up for fear of losing it.

The greatest drawback to arable culture to-day is the increasing scarcity of skilled labour. The farm man is a highly skilled workman, and has not received wages in proportion to those engaged in other businesses. It is of no use saying that the prices of produce will not afford it. We must pay more, or the rest of our young men will drift into towns or go abroad. The best way to start is to raise the wages for boys so as to tempt them to come on to the land. When once there, they will probably stay there.

In conclusion, all evidence goes to show that small holdings are a national mistake, except when in pasture or used for market gardening. Arable culture can be most economically carried out on large holdings, in districts where the rainfall is not excessive, on soils of medium texture, and in parts remote from towns and where there is still sufficient labour. "LEICS" in *Farmer and Stockbreeder Year Book.*

Light Horse Breeding.—There are some of us, who have for many years been calling attention to the way in which horse breeding—or, to be precise, light horse breeding—has been neglected. Ever since Lord Rosebery's Commission sat in 1873, from time to time a note of warning has been heard, and ignored, till now we are brought up to a round turn, and see the position in all the inconveniences it has brought about.

No good purpose will be served by dwelling on our past mistakes or in making undue lamentations over our present position. What we have to do is to learn from the former and make the best we can of the latter.

Within ten years of Lord Rosebery's Commission issuing its report, several breed societies had been formed and others were in course of formation; therefore many people thought that all was done that was

necessary. But it must be pointed out that the breed societies with the stud books emphasise specialism in breeding. no doubt an excellent thing taken on the whole, but which is open to the danger of inducing too much importance to be attached to minor points—such, for instance, as the extravagant knee action of some modern hackneys. Knee action, when accompanied by shoulder action, and when *not too pronounced,* is not detrimental to pace, and pace is what is wanted both in the riding and harness horse. But knee action, when the horse puts his foot down in about the same place as he takes it up from,—with something of the action of a plunger in a plunge churn,—is simply a fancy point and of no service whatever to the practical usefulness of the horse. This is one of the dangers of stud-book breeding. There is no doubt as to the value of these special points when combined with others; but if they are the only points that are emphasised, as too frequently they are, the breed must and does eventually suffer. Or, to put it in other words, if too much importance is attached to one or two points there is sure to be a good deal of injudicious mating.

I am of opinion from what I have seen that we have not taken advantage of our horse stock as we might have done. There have been many very serviceable mares which would have bred good horses if they had been wisely mated, and many of these have not been bred from at all. Some attempt has been made to "grade up" when they have been bred from, provided they happened to have sufficient pedigree to enable them to register in a stud-book.

This question of what to do with a mare that is registered in, or eligible for, a stud-book, and yet shows little or nothing of the leading characteristics of the breed, is one not very easily dealt with. If the pedigree is a long one, she certainly should have a chance of producing pure bred stock. I have known a mare, such as I describe, breed excellent pure stock, not one of which had the remotest resemblance to herself. Any mare that has good limbs and a fair shape but does not breed good pure-bred stock, should be tried with a cross—a thoroughbred for preference; for there is no service so impressive as the thoroughbred.

But there are plenty of mares in the country not eligible for any stud book, which have been something like a negligible quantity of late years. I do not wish to infer that such mares have not been bred from, but we have not taken the care of such mares that we might have done, and we have not used them to the greatest advantage. Let us do so now, and we shall soon have our horse-breeding industry on a much firmer and better foundation.

No one who has looked carefully over the horses bought for army purposes during the last few months can fail to be struck with a type which stands about 16 hands high, rather under than over, is on a short leg, has fairly good shoulders, good back and middle, and good bone.

A mare of that sort, and they are to be found if men would only look for them, should certainly be mated with a thoroughbred horse. But whether the right sort of horse is easily obtainable in all places is another matter. It has been urged by many writers, who have a theory of horse breeding to advance, that the modern thoroughbred is but a racing machine; that he is tall, leggy and narrow, flash in appearance but lacking in substance. As is the case with other more or less wild statements, there is some foundation for the exaggeration. It is undoubtedly true that the thoroughbred now is bred principally with a view to racing, and, considering the valuable prizes to be won, it would be strange if it were not so. But it is not correct to say that he is bred only for the purpose of sprinting, and that no regard is paid to make and shape and action when thoroughbred mares are mated. One of the finest judges of a horse, the late William I'Anson, was of opinion that stayers—horses which could stay two miles or more on the flat—were generally somewhat angular and narrow.

If every thoroughbred stallion is not adapted for mating with such mares as I have mentioned, there are many that are. The breeder must avoid anything like legginess in the horse he selects, and he must bear in mind that a thoroughbred stallion is not any better for being over 16 hands. The most successful thoroughbred sires of half-bred stock that I have known have been from 15 hands 2 inches to 15 hands 3 inches, while one was well under 15 hands.

In selecting a stallion, it must be remembered that measurement alone is not a proof that a horse is not leggy. Instances can be given of horses that stand 16 hands 1 inch, yet until you stand up to them, give the idea of being very little, if anything, over 15 hands 3 inches. These are very desirable as sires for they show how well they are balanced. Again, instances are not wanting of horses of 15 hands 3 inches giving one the impression of legginess.

A good plan, perhaps, is to choose a successful sprinter as a sire. As a rule, the successful sprinter is truly made, for, when one comes to think of it, only a horse that is perfectly shaped can gallop at his top pace for six furlongs. I have ridden several big horses of this class and always found them stand the longest and hardest days, because *they were cantering when the others were galloping.*

That is the class of horse we want to aim at breeding. He does his work without unnecessary wear and tear, and consequently he stands a long hard day's work well, and lasts years longer than his perhaps more stylish rival who lacks his balance. There are two maxims which the breeder will do well to bear in mind. Never breed from a leggy, narrow mare. Never use a stallion with bad shoulders.—WILLIAM SCARTH DIXON in *Live Stock Journal Almanac.*

Age to Calve-in Heifers.—There has always been keen controversy among dairy farmers as to the proper age at which to bring heifers into the dairy. At the present time there is no doubt that many farmers prefer a good two-year-old heifer, for there is a growing consensus of opinion that a well-grown two-year-old heifer makes a better dairy cow than a heifer that calves-in at three years old. After more than twenty years' experience of calving down heifers of all ages on my own account, and some years' experience on my father's farm before that, I have come to the conclusion that a three-year-old heifer, if she calves-in all right, is more likely to stand in the dairy than a two-year-old, but that two-year-old heifers, if well managed, are the more profitable, and more often make the heaviest milkers. It stands to reason that two-year-old heifers require intelligent handling, for the strain on the young animal of producing a calf, followed by the strain of milk production, and then, in due season, of becoming pregnant, call for a strong constitution and plenty of stamina. For a heifer to come into the dairy as a two-year-old, she needs a good start, and she does not need to waste a single day. This cannot be attained by feeding them on calf meal at a week or ten days old. I was looking over a bunch of calves lately that had been weaned entirely on calf meal from a week old, and as I looked at them (poor, wizened, pot-bellied little wretches), I thought they had lost the best three months of their life. Calf meal is a very useful aid to calf rearing if properly used. But in my humble opinion rearing calves on calf meal at too tender an age is responsible for a lot of the ills that afflict our cattle in these days. Such calves generally lose their calf-flesh, and at the same time, to a great extent, their stamina. Calves that are intended to calve-in as two-year-olds are best born in the months of November, December, January and February. There should be no difficulty in a well-managed dairy of getting sufficient calves born in these months, which are undoubtedly the most profitable months for cows to calve in, just as July, August, September and October are the four worst months of the year. Cows that calve in November and onwards will not only milk well all the winter, but keep up a good flow the

ensuing summer if well fed, and the calves born at this period, if properly handled, will grow better than those born at any other time of the year. If a calf is weaned at a week old and allowed a gallon of new milk per day until a month old, and half a gallon per day until two months old, with water to make up its liquid requirements, it will eat enough by then to keep itself growing, and only require water to drink, and, all things considered, it is difficult to wean calves more cheaply. I do not believe in pampering young stock of any sort, and therefore I do not think it advisable to give too much concentrated food per day to young calves, especially those intended for the dairy.

In this part of the country, calves are turned out to grass in spring, and if fed 1℔ of good cake per head per day generally do extremely well during the summer. There are thousands of calves reared in this district every year, and not 5 per cent. of them are housed as yearlings. Personally, I give mine a good run where they can get some old grass to pull at, and plenty of shelter, about 1℔ of cake a day per head, and only one feed of hay daily, both given in the morning early, as soon as light. Where out-lying cattle are fed two or three times a day, they never touch what grass they may have, but are whining for fodder all day long. I find that where cattle have plenty of old grass and a good run they do infinitely better if fed only once a day, even if yearlings. Yearlings bred on these lines grow into hardy, robust cattle, and as the grass grows in spring on anything like decent land, they will grow rapidly, and at sixteen to eighteen months old will readily take the bull—say in June or July. Some farmers are very nervous about calving-in two-year-old heifers, but I have calved-in scores of two and three-year-old heifers, and, on the whole, I have had less trouble with the two-year-olds than with the older cattle. But I always make a point of keeping them well during the last three months of pregnancy, giving them from 2 to 4℔ of cake per head daily, which is the making of them.

Looking at the subject from a commercial point of view, the two-year-old heifer pays much better than the three-year-old. The three-year-old heifer has to have an extra year's expense tacked on to her, and is then not worth a great deal more than the two-year-old. Against this, it must be admitted that when heifers are intended to come in as three-year-olds, they can be run rougher and allowed poorer land. Taking it on the whole, I think it pays to keep them well and bring them in as good two-year-olds. It is the duty of all farmers to wean all the healthy, good calves they possibly can, and wean them well, so that they will develop at as early an age as

possible, for they are sure to be wanted. Inferior, poor-sorted calves should not be weaned. Not even a national crisis justifies farmers in rearing screws.—"SOMERSET FARMER" in *Farm and Home.*

Agricultural Experiments.—We give this title to the following remarkable editorial article which has recently appeared in the "Experiment Station Record," published by the U.S.A. Department of Agriculture. There it is referred to as "Plant Physiology in Agricultural Courses," but we prefer to consider it as a criticism of Agricultural Experiments as they are, and a valuable suggestion as to what they should be :—

Crops are aggregations of plants, governed by definite laws and responsive to various factors and conditions. These laws and the influence of factors and conditions on the life of crops constitute plant physiology. Hence an intelligent understanding of plants and their growth implies a study of plant physiology.

In a recent publication a criticism is given of the courses of botany in the agricultural colleges of this country, and a plea is made for more attention to plant physiology. If, as the author claims, "the object of agricultural education is to produce farmers who will do their work more intelligently," the criticism is just. For the individual who contemplates following agricultural pursuits a proper understanding of plant life is essential, and such a view can be obtained only by observing how different organs of the plant co-operate to produce the phenomena of growth, nutrition, reproduction, etc.

The student of agriculture is vitally interested in plant life and should be given ample opportunity to learn the normal behaviour of plants, for it is upon the proper development of his crops that his success as a farmer will depend.

Fortunately, more attention is now being given to the plant as a living organism ; and, in order to provide sufficient opportunity to more completely study the plant as such, some of our greatest institutions no longer attempt to cover equally all the branches into which botany has been divided, but content themselves with specializing along a few lines. This principle could safely be adopted by others. In making such an adjustment, the agricultural colleges should frequently give a larger part to plant physiology than is now given to it.

In courses of instruction dealing so largely with crops it would seem that more consideration should be given to the principles underlying their growth, nutrition, water requirements, reproduction, etc. Doubtless in some way the general facts are set forth, but it is

probably true that comparatively few students have first-hand information regarding these subjects, and at most only as related to a single leading agricultural crop.

There can hardly be anything more important to the farmer than definite information and understanding regarding the growth of his crops. "Plant Industry" as a science must rest on an understanding of plants. And yet, the normal rate of growth at various stages of development for the conditions under which they are working, is practically unknown to the average student and, indeed, to many experimenters. The influence of various factors on growth is little understood, except in a very general way, although some of these factors can be controlled and growth accelerated or retarded as is necessary or desirable. Probably very few students follow through the various stages of a single crop to determine its normal growth, and the influence which the more important environmental factors exert upon it.

Perhaps next in importance are the questions of transpiration and water supply. In the regions where irrigation is generally practised it is quite evident that there is little or no attempt at a system of applying water that is based upon the physiological activities of the plant. This leads to irrational practice and to applying water that may be wasteful and injurious. The assumption that crops all require the same amount of water and at the same intervals during the growing season is manifestly wrong, yet in many localities the only measure is so many inches of water at certain arbitrarily determined intervals. This is often based upon the engineer's estimate of the amount of water available and not upon whether or when it is needed; and it is not only wasteful of water but may be positively injurious to the crop and detrimental to the soil. It is well-known that the water factor can be controlled to a considerable degree, and if students were required to study the matter in detail, paying attention at the same time to transpiration under controlled conditions, a new practice in irrigation-farming might ultimately result. It is probable that plant nutrition receives more attention in our agricultural colleges than any other physiological function. But even here the laboratory work is reduced to the minimum, and much is done in field plots where definite control is lacking. There is need of much more study of plant nutrition than is included in fertilizer tests, as they are usually made. Water cultures, supplemented with pot and plot work, might be carried on in such way that the student could determine for himself the important facts in the mineral nutrition of plants. This is one of the plant activities that can be rather definitely controlled, and the

fundamental principles underlying the application of fertilizer elements should be thoroughly mastered.

While Photosynthesis, which is very little subject to control or regulation, is generally studied where laboratory work is done, other functions that may be definitely directed to the advantage of the crop and the profit of the grower are neglected. Respiration, the response to stimulus, and the physiology of reproduction, are usually passed over with slight attention, although all of these functions have a direct bearing on the welfare of the plant. In the field of investigation, one aspect of plant physiology is almost wholly overlooked, that is, the relation it bears to plant diseases. So long as the normal functions of the plant are not fully understood it will be impossible to know very much of the abnormal or pathological conditions. Studies are generally made of the organisms which cause disease, and experiments are conducted that seek to control their spread, but very few investigations are undertaken to determine the nature of the effect of the parasite on its host, or as to how the injury is brought about.

The study of plant diseases due to fungi and other organisms receives much attention, but the large and important class of plant injuries due to what are usually designated physiological disturbances receives rather scant study. True, little is known of how these disturbed conditions are brought about, but this lack of knowledge should stimulate investigation along this line. In the treatment of plant diseases the outward manifestations are usually given more consideration than the constitutional changes produced. As long as this is true, prevention rather than cure will be the result. But, even in the prevention of plant diseases, very little is known as to the principles underlying immunity or resistance to the attack of certain organisms. If more emphasis were given to the importance of a study of plant physiology in its agricultural relations, more investigators would be trained who might address themselves to the problems in that field.

The extent to which the physiological aspects of plant growth are studied or taken account of in connection with field experiments seems quite inadequate. These experiments are extensive in number and constitute a large feature of experiment station work. But much as we discuss their importance and their limitations, and attempt to provide greater accuracy, features of great significance are often neglected which would add to their information value and assist in their interpretation. Too often the end sought seems to be comparisons measured by ultimate production, rather than the tracing of relations between causes and effects. Field experi-

ments with agricultural plants, considered in their fundamental aspects, are to a large extent studies of the response of these plants to definitely known environmental conditions; and yet how rarely are these responses measured expressly or continuously at successive stages. To determine the response effectually, the conditions must be definitely known, and the plans must be so made and the observations so taken that correlations can be attempted. The life processes in the growing plant need to be followed if the effects of the special conditions imposed are to be determined.

Consider the usual field experiment with fertilizers, or upon the preparation of the land, or culture methods, or date, or rate, of seeding, rotations, and the like. The land is selected and prepared with care, divided into plots with mathematical accuracy, and the different treatments carried out systematically. Notes are taken from time to time on the general appearance of the plots, often supported by photographs, the date of blooming or fruiting, or other stages noted, and when the crops are harvested provision is made to insure against loss, and the weights or volume are accurately recorded. Analyses may be made of the materials applied or sown, and of the resulting crops, but the growing crop is usually not studied in a way to determine the manner in which it is responding to the special conditions. Rarely, indeed, are any systematic measurements taken of the plants, or attempts made to get at critical stages of growth or the effects of the treatment at such times. The physiological activities of the plants throughout their growth are not followed, and often cannot be followed because the field experiments have not been supported by experiments which provide a larger measure of control. The growth under the special treatment cannot be compared with the normal growth at various stages, because provision for this is lacking.

If conditions of normal growth were maintained as a check, it would be possible to judge of the accelerating or retarding effect of such treatment at successive stages, and the adaptability of the plant, and its capacity to overcome adverse conditions, or to minimize their effects later, could be arrived at with considerable accuracy. Furthermore, something could be learned of the effects of changes in temperature of the air or soil, or the periodicity of the rainfall and other external phenomena which experiments in the field are subject to. Instead of measuring these, the attempt is usually made to eliminate them by averaging the results of several years. In short, the usual field experiments teach but little in a definite way as to the life of the plants concerned in them, or of the exact conditions of their growth, and they contribute far less than

they should to a thorough knowledge and understanding of these plants.

In these experiments the main interest and reliance seems to be placed on the weight or bulk of the harvested crop. This, of course, is the final measure, from an economic point of view, to determine whether a practice or treatment is profitable or advisable. But in investigation, and in all experiments except those of the most rudimentary kind, the aim should be to learn something of the way in which the result has been brought about, and the effect upon the plant of the imposed conditions, not merely the economic result. The living plant must be studied quite as much as the final yield.

These things are highly essential if field experimentation is to develop along scientific lines and make progress in laying the foundation for an intelligent agriculture. They require far more attention to details than is now given. They require continuous study, with attempts at correlations of growth and specific conditions throughout the season. Otherwise, the final result is a composite result of all the conditions, and there are no means for determining how much is to be attributed to particular artificial conditions imposed, or how far the effect of these has been masked by unfavourable conditions.

To make these continuous studies of the plants and their surroundings implies a smaller number and less diversity of field experiments, with greater attention to those which are undertaken.

This might relieve the necessity for some of the repetition that has been going on for so many years. It will mean more study in planning the work to provide such checks as are necessary to furnish reliable comparisons, under refined conditions of experiment. It will call for some system of accurate measurements at regular intervals, and the recording of uncontrolled phenomena which may influence growth or physiological function. It will require living with the experimental material—a closer association with the plants, and concentration on their study. Under such conditions there will be no lack of problems. The investigator with vision and imagination will be confronted with them on all sides, and instead of allowing them to bewilder him with their confusion he will devise means to regulate them and take account of them in his plan of experiment. This will make the methods of experimental agronomy more exact and more searching in character, and will make interpretation more sure.

The Ponies of Wales.—Up to within the past thirty or forty years comparatively little attention was paid in Wales to the breeding of

the Mountain ponies. They rambled at will over the vast mountain commons, being left in winter to fend for themselves. In autumn the herds were collected, sorted, the marketable selections disposed of, and the remainder returned to their native hills. There was not even a law requiring owners to keep their stallions confined. Anyone might turn loose a worthless brute of alien blood if he chose, but the climatic and topographic environment prevented degeneration.

Now breeding operations are mostly carried on much as they are with other breeds of horses, though there are still some bands of ponies roving free over the hills of Wales to the improvement of which little or no attention is paid, yet sometimes splendid specimens are developed among them. Naturally every effort to inject and retain cob characteristics must be carried on through forced selection, because they are not native and once left to perpetuate themselves are quickly lost.

To whatever cause it may be due, the fact remains that there is about the Welsh pony a measure of gimp and courage, nerve, stamina and speed that inheres in no other breed. The fibre of the unadulterated Mountain type is finer than is extant in any other sort of pony. As a breed it possesses far more speed than any other, and its strength and endurance are beyond the comprehension of all who have not seen these hardy little warriors at work on their native hills. They have more elegance, more quality, more courage and capacity than all the rest, and the purer the Mountain blood of the ponies the more they excel in these particulars.

Those who would decry their merit have charged them with being flighty, unreliable and hard to break. No true bill of the sort can be brought against them. There is, however, nothing of sheep-like submission about them. In the hard school of nature, in which they have been taught for ten times as many generations as can be boasted by the purest of our other so-called improved breeds, they have learned the necessity of eternal vigilance and of readiness to move rapidly. They are always at attention. A slip in a treacherous bog or on the stony hillside, the sudden onslaught of a hidden foe, a falling boulder or a slide of snow may, for generations untold, have meant death or disablement. Is it any wonder that intelligence, alertness, refinement of fibre and speed have come to be and have remained the dominant characters of the Mountain race, these qualities carrying with them the slope of shoulder; long, well-muscled quarter; short, stout back; strong though not too long or too heavy neck; fairly high-set, well-carried tail; mobile ears set well forward; small, clean, bony head and prominent eye; stout,

clean joints; ivory-like bone, and neat, tough, round hoofs that mark the Mountain breed?

The Mountain breed has resisted the encroachment of all other types but the Arab, injections of that blood having been absorbed and speedily assimilated. To the breeder of Polo ponies and cobs the Welsh Mountain type has commended itself as the best possible foundation whereon a small equine structure could be raised. Some of the most famous of the early Hackneys had Welsh blood in their veins, and some of the greatest cobs in Wales carry a liberal infusion of the Hackney. Some of the old-time celebrities, famous for speed, are recorded in both the Hackney and the Welsh books. Many of the most valuable Polo ponies have had Welsh granddams. The intelligence and quickness of movement inherent in the Mountain breed are invaluable in the Polo pony.

It is very doubtful whether the breeding of Polo ponies and harness and saddle cobs will ever assume in America the proportions to which it has been carried in Britain. We do not need the Welsh ponies for any such purpose. What we do need them for here is to teach children the rudiments of horsemanship, and to give pleasure to the men and women who love great equine usefulness and excellence in small bulk.

Welsh ponies come in all colours, greys, having been very popular, especially in Britain, for some years past. This has been owing to the great excellence of a tribe or line of blood named Daylight, tracing from an Arab infusion made some seventy years ago, from which a multitude of Graylights, Starlights, Skylights, Sunlights, Moonlights and other luminaries have emanated. The superb little stallion, Graylight, long invincible in the Mountain class in England and Wales, shows the accepted type of the Welsh Mountain stallion in his highest estate.

Importers have found it much harder to buy good greys than darker-coloured specimens, hence many of the best we have are bays, browns, chestnuts and blacks. These colours are always standard here, and some purchasers prefer them to the greys, which with age become white. In this country greater satisfaction will accrue from an effort to breed Mountain ponies than larger sizes. Given a proper selection of foundation stock, the fixity of character and prepotence of the race, by virtue of its hundreds of generations of pure breeding, are such that satisfactory results may confidently be predicted. On the other hand, this very inherent strength will perpetuate any mistake the breeder may make in laying his corner-stone.—*Country Gentleman.*

Calf-Rearing.—Extracts from a Lecture by G. B. Shields to East Lothian Farmers' Club :—

They were there that afternoon, he took it, to discuss the ways and means whereby the store stock of the country might be increased, and more especially what they might do themselves in the way of calf-rearing on their own account. Calves can be reared in a variety of ways. On Dolphinstone for a number of years we bought, in the "back-end" of the year, black cross Galloway heifers, wintered them out, and served them in the spring with a white Shorthorn bull, and had them calving the following year from January onwards. Heifer and calf were well grazed, and cake-fed all summer, spayed in October, and both heifer and calf fed off as quickly as possible. The young cows we generally got away by about New Year time, and the calves (having never lost their calf flesh) in the spring and early summer. This method has its disadvantages. The heifers had to be kept for fifteen to eighteen months before calving, and the second year, while nursing the calves, the next year's lot had to be grazed, so that it took a lot of grazing to keep this system going, and most of it having to be done on 50s. per acre land, it put a big debit balance against the value of the calf. The heifers when fat had to be sold at little more than cow beef prices, and often did not realise paying prices. Irish heifers crossed with a black Angus bull were also tried. They were not fed off after the first calf, but wintered as cheaply as possible, and brought round to calve again. The next year we made each cow rear two calves, either buying them in or selling some of the young cows for dairying purposes, and using their calves for doubling up with the others. This method, when there is a good demand for dairy cows, is quite a good one, and is carried out very successfully by a number of men. Then we have the keeping of a regular stock of well-bred Angus or cross Angus cows, using a good white Shorthorn bull to them, and we buy in as many calves as to give every cow a pair to rear. In this way the very best class of young stock is produced. Some men who have cows calving in January and February put on two calves to suckle the cow, and, in May or June, after the calves have been taught to eat cake, take them off and put on another two. This is an excellent method, but entails some very close attention at "the breaking up of the family stage," and unless the cow is of a mild disposition, and the man in charge has the patience of Job, there is apt to be some strong language heard about the boxes. It can be done, however, and amply repays anyone who does it; some even go the length of putting on a fifth calf, after the second pair are speaned, to finish up what milk is left in the cow.

One great consideration in carrying out either of those methods is keeping the cows cheaply from spayning time in October till calving time in February or March, and East Lothian provides a vast amount of eminently suitable keep for the purpose, which is practically lost on a great many farms. I mean the keep on foggage fields, after the hoggs have been put on to seeds or turnips, and the aftermath after second crop hay. On many farms the ewes get this to work on till about the New Year or so, but when no ewe stock is kept it is practically lost. Then, for inside keep of cows, I would emphasise the necessity of looking after the chaff and cavings at threshing time. If anyone cares to examine the barley cavings, especially where the crop has not been a rank one, and gets them analysed, he will find that he is often paying merchants cash for cattle feeding stuffs which are little better than what he is putting into the courts for bedding. I threshed a 26-acre field of wheat last year and bagged the whole of the chaff; it amply repaid me for both wintering and feeding purposes. It is wonderful the amount of chaff that can be stowed away in a few bundles of potato or washed manure bags. In summer the keep of cows necessitates having, or laying down part of the farm to, permanent or temporary pasture.

I now come to the last and the most interesting system—that is the rearing of calves by hand or "on the pail," as it is called. A cow calved about the beginning of January, and, instead of selling her, I decided to see what could be done in the way of rearing calves with her milk and milk substitutes. On the first of May, seven useful-looking youngsters were running out to grass and coming in at nights, with two younger ones following up. The first thing I did was to arrange with my cattle-man to undertake the feeding of the calves, on the understanding that he got a bonus on every calf he reared and had at grass by midsummer, the milk for the purpose being handed over to him morning and night by the woman who milked the cows for supplying the farm. The next thing was to fix on the milk substitute to be used, and I started with Bibby's Cream Equivalent and have stuck to it. It seems to do all that is claimed for it, it is simple to handle (a great consideration), and, being composed of a variety of ingredients with an excellent analysis, and in a partly cooked condition, is not likely to hurt young animals if given by mistake in quantities over what is recommended by the sellers. I got two calves sent from England each week in January, making six, and one in the beginning of February, as the six were doing so well. The calves I got were all ten days' old, or supposed to be, and on arrival they each had two glassfuls of

castor oil, and one of whisky, and milk and water for the first day or so. For the next three days, one quart of milk was given three times a day, and after that we fed only twice a day and increased the milk till they were getting two quarts night and morning. When they were about three weeks old we started the cream equivalent, made up as directed, and, as the young calves came to take more milk, the equivalent was increased to the older ones till at about two months old they were getting one quart of milk and fully 2½ quarts of equivalent night and morning. In April, when the oldest of the calves were getting on for three months old, they were only getting about two pints of milk and four quarts of equivalent, and about the beginning of May milk was stopped. When they are about a month old it is most essential to teach the calves to fend for themselves, and they are very easily started by putting a few pieces of fine cake or bruised oats into the pail after feeding. They will soon come to take it dry out of small boxes. The mixture I used contained bruised oats, bran, linseed cake, and Bibby cakelettes. At about three months old some would take one pound a day, and they also had a few turnips cut into fingers. Hay, also, they should have to pick at, and there is no better temporary calf hay-rack than a poultry hamper, as supplied at poultry sales or shows, fixed up in the corner of the box. The question of a supply of hot water for making up the gruel and keeping pails clean has to be thought of, and, when rearing is gone into on a large scale, a boiler is necessary. On 75 per cent. of farms, the house is close to the steading and the kitchen on the steading side. Mine is so situated, and I overcome the hot water question by having a pipe from the house hot-water supply led through the wall to the outside, so that hot water could be got at any time, and it worked admirably. One or two points may be mentioned which were found useful and might be helpful to anyone who intends having a try at calf-rearing. Provide yourself with a small pen or corner where you can isolate your newly bought-in calf for a few days till you see that it is quite clear of white scour. Use hot lime wash and disinfectants about your calf pens occasionally, whether you have had this trouble (white scour) or not. Rather underfeed than overfeed for the first week, and get the youngsters on to dry food as soon as possible. Don't give them great buckets-full of slops, or you will soon have them looking as if they wished to graduate as Bailies. Keep a bottle of dishorner by you, and dehorn the calves the first week you have them. Keep the boxes dry and comfortable, and the pails and feeding boxes scrupulously clean.

I have been reading lately about the experiments on calf-

rearing conducted by the North of Scotland College of Agriculture, the Woburn experiments of the Royal Agricultural Society of England, and the Irish experiments by Prof. James Wilson. In all these separated milk was largely used along with milk substitutes. An experiment with separated milk is of little use for our purpose in East Lothian, as we never have it to work with. If any further experiments are carried out by any of these institutions, I would suggest that a pen be put up to find out the smallest quantity of new milk that can be used along with substitutes, and that at the same time the calves be sufficiently nourished to ensure their proper growth. One thing the Woburn experiments bring out is, that calves reared on crushed oats as their dry feed came out best, showing the highest gain in live weight and the lowest cost per pound of increase. I can compare the experiments with my own experience in the cost of rearing per week. The North of Scotland rearing cost from 3s. 10d. on new milk to 1s. 3d. on milk substitutes; the Woburn from nearly 6s. on new milk to 2s. on substitutes; and the Irish from 4s. 9d. on new milk to 2s. 1d. on substitutes. Mine work out at 1s. 9½d. I had an outside man, who makes his living by buying and selling calves, to value them, and he offered me 87s. 6d. so that there is a small margin of profit. I was not a seller at the price. One thing which helped to keep down the expenses this year was that there were no deaths, although several of the calves had white scour pretty badly.

This concludes my remarks, so far as calf-rearing is concerned. But I should like to make a suggestion which, if carried out, might very materially increase the numbers of home-bred cattle in Scotland. It is that the East of Scotland College of Agriculture should equip thoroughly up-to-date premises at their new farm of Dreghorn, where a number of calves could be reared till they were about five months old, and then sold to farmers or in the open market. Premises might be fitted up to accommodate, say, fifteen calves coming in every week, these fifteen to go through the various stages of rearing from the isolation in the calf pens to running loose in boxes or yards at four or five months old, when the first fifteen would be ready for disposal. After one year's working, there should be about 800 more store cattle in Scotland. The premises, of course, would require to be capable of holding something like 300 youngsters at one time. The work in connection with calf-rearing is not heavy, but requires a large amount of attention, regularity, and cleanliness, and if the College were to fit up the correct sort of housing, and the work were carried out under careful scientific management, there seems no reason why it should not be made a huge success. The raw material

is already at hand for working on, and can be seen any week in the Gorgie markets. A market for the produce is absolutely sure. A practical lesson in scientific calf-rearing could be seen by any interested, and thereby be the means of fostering and extending the industry. There would be an increase in the store stock of Scotland by 800 per annum from this source alone. And there is no reason why the scheme should not be a financial success.—*The Scottish Farmer.*

The Science of Manuring.—Professor M. Hoffmann, of the German Agricultural Society, contributes the following paper to the "Monthly Bulletin of the International Institute of Agriculture" :—

We have not yet been able to solve the weightiest problem of the science of manuring, namely, how to find out, rapidly and surely, the manurial requirements of a given piece of land before a crop is put into it.

Yet there is no doubt that we have got a good deal further in this direction in the last ten years.

Water containing carbonic acid was known to the older agricultural chemists as a means of obtaining a soil extract suitable for analysis. To Mitscherlick belongs the credit of having instituted researches regarding the temperature, concentration, and duration of influence of this agent, and of obtaining partly satisfactory results from it. He succeeded in finding out, with reference to the cultivation of spring sown cereals, a regular relation between the quantities of constituents found in the carbonic acid soil extract and those recovered in the harvested crop. His experiments have not yet stood the test of independent investigation.

It will be interesting to see whether the methods suggested by König for determining the assimilable mineral plant foods of the soil prove reliable. König starts from the assumption, which has a good deal to be said for it, that the pioneer work of micro-organisms, yeasts, and catalases in bringing into solution the compounds of potash and phosphoric acid in the soil, is most readily investigated if the soil to be examined is previously steamed under pressure. For potash requirements, König believes in steaming for five hours under a pressure of five atmospheres. As a result of his latest experiments, he arrives at certain standards; for example that soils of which the potash content rendered soluble by steaming only amounts to 5 mgms. per 100 gms. of soil, will benefit by a potash dressing, whereas if this figure reaches 8 mgms. the soil does not need potash. In the same way a soil which after steaming gives less than 4 mgms. of soluble phosphoric acid will profit by a dressing of phosphates.

At the same time, he does not wholly reject as an extracting agent the 2 per cent. citric acid solution recommended by Gerlach of Bromberg, more than a decade ago. Unfortunately the indefatigable veteran experimenter has not hitherto, in the course of his comprehensive researches, been able to determine definite relations between the quantity of nitrogen and of lime taken up by plants and the absolute quantity of these substances existing in the soil. He is, however, of opinion that in this case the percentage content of the dry matter of plants provides a sufficient clue as to whether these substances are present in the soil in sufficient quantity.

Such an admission as this is a further stimulus toward plant analysis, the applicability of which has, in the last few years, been advocated by Wagner and Pfeiffer. Wagner's doctrine, that the need for manuring a meadow with the chief fertilizing agents, increases the more widely the content of its air-dried hay varies from the limit values "2 per cent. potash, 0·7 per cent. phosphoric acid, and 1 per cent. lime," has already been frequently confirmed, and steps are now being taken to establish similar standards for spring-sown cereals. In calculating an analysis of hay, the fact must be borne in mind that, as a rule (and my own investigations support this), the second cut is richer than the first in phosphoric acid and in lime, as well as in protein, while on the other hand the potash content is lower. It may here be remarked that in the last five years nitrogenous manuring for meadows and pastures has come more into fashion in Germany than could justifiably have been expected from the opinion hitherto prevailing on the subject.

A fact which is not without its significance in the practical application of statical calculations, is the discovery, which has received repeated confirmation, that the ratio between the plant foods found in the composition of normal plants is something like 100 nitrogen, 50 phosphoric acid, 150 potash, 80 lime, although many plants, the Leguminosæ, for example, show considerable divergencies from these proportions. The farmer who estimates the stock of the principal plant foods per acre in each piece of arable land, on the basis of an up-to-date and complete soil analysis, and from this subtracts the quantity of plant foods contained in the forthcoming crop at harvest (allowing about 1 per cent. for wastage) on the above ratio, will be able to measure approximately, before the annual crop sowing, the quantities of manure which he must still apply to his land. In doing this however, he must take into consideration the average co-efficients of utilization of the said plant foods and all the other factors which influence the productive capacity of the soil. If he continues this calculation in subsequent

years, he will, of course, not need a fresh soil analysis, the previous year's figures being used as a basis.

There exists at present no method at once rapid and entirely free from objection, of determining the manurial requirements—not the plant food requirements—of a soil, and there is not likely to be one until the biological and colloido-chemical actions taking place in the soil have been more clearly defined. The work of decomposition due to bacteria, the numerous sources of production of carbonic acid, and the conditions affecting the coagulation of colloid substances—which is important for growth—are matters too complex and varied, even on the smallest scale, to admit of being expressed in numerical terms, from our present knowledge, and with our present methods of investigation. The Law of the Minimum has recently formed the central point of numerous investigations. P. Mazé wants this law to be designated "The Law of Physiological Relations," since the amount of plant-production depends on the collective effect of a number of growth factors, each of which individually exercises on that amount a retarding influence proportional to its own proximity to the minimum. This suggestion may be based on a germ of truth, but at the same time the name "Law of the Minimum," chosen by Liebig, will not so soon disappear from the vocabulary of practical scienists; and it may well be preserved for application in the case of plant foods, since these are factors over which man can exercise a vigorous control.

Even if more arable land is eventually to be permanently cropped than is at present, the sun's energy will still remain no more than a powerful contributing factor. The quintessence of human art in agriculture lies, in my opinion, in the correct application of fertilizers to well prepared soil, and in sowing productive varieties. The remains of the roots and stubble of grain and of root-crops do not by a long way leave in the soil the quantities of plant food required for the attainment of maximum harvests. In the case of Leguminosæ, even if the whole of the aerial portion of the plants on a field were applied as green manure, the utilization of its constituents by the succeeding crop, with the aid of bacterial and chemical processes, would still, in the majority of cases, by no means come up to expectation.

The same applies, in the long run, to the utilization of the nitrogen in farmyard manure, which can, however, be greatly improved by keeping the liquid and solid manure separate in the cowhouses.

A series of experiments is now in progress in Germany, with the object of discovering within what limits home produced manures

can be replaced by commercial manures. The trials which have been carried on during the last seventy years on the home farm at Wingendorf, near Freiberg, in Saxony, seem to show that this method of farming cannot be continued through several decades without fundamentally impairing the yield, except on good soils containing plenty of humus, and even then, only when the remains of the roots and stubble are allowed to accumulate for the enrichment of the soil.

The majority of the German farms carrying no live stock work principally with green manure or, in some parts, also with night-soil combined with heavy dressings of artificial fertilizers, while here and there manure is purchased from neighbouring towns, or straw is handed over to neighbouring farmers to be used for making manure, and returned. Farms using only commercial fertilizers exist in isolated cases, or this system is confined to the outlying portions of the farm. In any case, it has been found again and again that profitable root crops can, as a rule, only be obtained by an intelligent combination of home produced and commercial manures. Cereals following a previous crop dressed with farmyard manure or green manure, usually pay well for a complete dressing of artificial fertilizers suited to the previous crop and to the strength of the soil. It is a universal rule in all the better managed farms, to keep the replacing of plant foods at a minimum, or, having regard to the kind of manure, crops, and soil, and to the rotation practised and the general circumstances of the farm, to approach the line of soil enrichment, taking into account the time occupied by the various farm crops in absorbing plant food.

It is certain that the great increase in the consumption of artificial fertilizers, which represent an expenditure of some 600 million marks by the German farming industry, and the corresponding increase in our crop yields, are due neither to the superstitions of ministers, nor to unsound or misleading theories, but to systematic and representative researches, and to accurate reports of the results of experiments.

There is no doubt that, in spite of being heavily over-burdened with the work of analytical control of agricultural goods, the representatives of science have made good use of their time, and that many gaps in our knowledge have been filled up within the last ten years through their accurate and methodical researches. It is a matter for congratulation that the Government and other competent authorities recognise the activity and success of these experiment stations, and assist in promoting the development of all institutions of this kind.

Cleaning and Care of Dairy Utensils.—Since it has been known that the majority of the changes to which milk is subject are brought about by bacterial influence, a special significance has attached to the care of the various utensils with which milk comes in contact. The fact that all visible foreign matter is removed every time after use is not sufficient. It is by invisible dirt that milk " diseases " are carried about, just in the same manner as diseases are conveyed from one human being to another.

Each time after use all utensils should be rinsed over with cold, or slightly warm, but on no account hot-water. This removes most of the milk and makes them easier to wash thoroughly with warm water. Brushes should be used, and every corner and tube must be made perfectly clean. Then each one, or part, requires a thorough scalding with water that is quite boiling, or better still, " live " steam. After this invert them on a bench or table where fresh air can circulate round them, until they are required again. Do not wipe the inside with a cloth, or all the good done by scalding will be of no avail. The object of scalding is to kill all forms of bacterial life, not to clean the utensils—that should be done by washing. If after being scalded a germ-laden cloth is rubbed round them, of course, it leaves a host of germs wherever it touches.

Fresh air and light, more particularly sunlight, are deleterious to the growth of bacteria, which prefer dark, damp situations. If there is a convenient bench outside the dairy, it is a good plan to put pails, strainers, the interior parts of the separator, etc., out in the open when the weather permits. They will then be perfectly sweet and fresh when required for use. It is not wise, however, to leave them outside when the wind is blowing dust and rubbish about, and especially if it is blowing from the direction of the poultry yard. The dust which comes from there is laden with the germs which produce " gassy " fermentation in curd, and sometimes cause frothy or sleepy cream. Besides causing a considerable loss, these are very tiresome to get rid of when once they get into a dairy.

At frequent intervals dairy utensils should have a thorough overhauling. All cracks should be repaired as soon as they are noticed. This prolongs the life of the utensils, and also saves scratches and minor injuries to the people using or cleaning them. Cracks inside milk churns and pails, if neglected, soon become breeding grounds for objectionable germs, which may produce all sorts of trouble in the milk that is put into them. Rust has some peculiar action on milk which prevents the process of coagulation with rennet from proceeding normally. Milk coolers made of

copper tinned over should be carefully examined every now and then. With the constant friction of the milk running over, the tin becomes worn away, exposing the copper. This has several times been found to be the cause of a peculiar flavour which has caused considerable anxiety to milk-sellers. After the coolers have been re-tinned, the trouble has immediately disappeared.

In the winter, utensils that are not required should be cleaned, dried, smeared over with vaseline, and put away in a dry store-room until required again. It is a mistake to keep utensils that are not in immediate use in the dairy, where it is impossible to keep them perfectly dry, and they soon become rusty. When they are needed again they take much more cleaning than would be the case had they been properly stored away. Besides, the rust eats into the metal and takes a considerable sum off their value, while it also makes them wear out quickly.

Before being used new tin utensils must be well scoured with a mixture of fine sand and whiting. After this, a good washing in hot water, followed by the usual scalding, will prepare them for any purpose.

A new churn that is properly "broken in" will not give any trouble subsequently. The best plan is to scrub well, using a little soda in the water. After this, scald with plenty of boiling water, then fill with water and leave to soak until it stops leaking. Then fill the churn nearly full of buttermilk and churn for a few minutes. If convenient, leave the buttermilk in the churn for several hours, or until the next day, turning it first one end up, then the other, every now and then. Empty and wash in the usual way, and when the churn is required for use it will be found to produce good butter, quite free from any taste of new wood. It is important that it be well washed after soda has been used, so that no trace of the alkali is left, as this has a tendency to make cream go "sleepy," or froth up and stick to the sides of the churn instead of "breaking" in the usual way.

Neither soap nor soda should be used regularly for cleaning churns—it is not necessary when plenty of hot water is used. There will not be much grease inside a churn if the butter has been properly made. It does not pay to leave butter-fat sticking to the churn.

A new butterworker should have a good scrubbing and scalding. After it has been cooled by pouring cold water over it, take some salt and brush well into the top and roller, afterwards rinsing this off with plenty of cold water. This treatment closes the pores of the wood, and prevents the butter sticking. Scotch hands and butter boards may be treated in the same way. When they are finished with,

a scrub down with plenty of very hot water is all that is necessary, except on special occasions. As Scotch hands become old and worn, the grease does get into them, and then soda has to be used. When they get past responding to this, it is time to discard them and purchase new ones. Butter boards can be made like new again by having them planed over when they are quite dry.

All strainers and cloths require frequent scalding and a good boiling with soda fairly often, and they should be dried in the open air, or at least hung out every day. Brushes and dish-cloths when neglected acquire a nasty smell. They also very soon become slimy, and besides being most objectionable to use, they contaminate the milk, acting as a breeding place for germs, and carrying them to the various utensils with which they come in contact.—" E. F." in *Mark Lane Express Almanac.*

Milk Records in Scotland.—At no time was the maximum production of dairy produce more urgently required than it is at this crisis in the history of the nation. Cheese in particular is sure to be in good demand in view of the probable rise in the price of other commodities. Fortunately the past season was, on the whole, a favourable one for cows giving a good yield of milk. Those farmers who are owners of milk-record herds of cows which have been graded up to a high plane of production, are reaping the benefit of their foresight and initiative. There can be no better method of developing the agricultural resources of the country than that offered by the milk-record movement in Scotland.

This movement seems to have taken firm root in this, as in other countries. At one time most farmers were content with merely guessing at the relative profitableness of their cows. They were satisfied if their herd as a whole repaid the cost of its upkeep and returned a margin of profit, but they did not trouble to find out exactly which cows were yielding the profit, and which were simply living as parasites on the others. But some of the more enterprising farmers commenced to keep private records of the milk yield of each of their cows separately, and gained much benefit thereby. The keeping of private milk records, however, was found to entail a great deal of trouble, and a movement was set on foot, first in Denmark about 15 years ago, to compile more or less official milk records of individual cows by co-operative methods. Since that time the movement has spread widely in different countries, including the British Isles; more extensively in Scotland than in England or Ireland, Scottish farmers having taken up the scheme some years in advance of the two other countries.

The main objects aimed at are to provide the owner with definite information as to the quantity and quality of the milk yielded annually by each of his cows, so as to enable him to estimate their relative profitableness correctly; to provide him with an authentic permanent record of milk yield of individual cows which he may offer for the information of other breeders or buyers interested; and, in general, to increase the production of dairy produce in the country.

Much is being done in Scotland at the present time to encourage more dairy farmers to join in this movement. A considerable annual grant of money is made from the Treasury for the purpose. Farmers who express a desire to participate are organised into small local societies of about 17 or 18 members each. A trained milk recorder is appointed to each society. His duty is to visit each farm in his circuit in turn one day in every two or three weeks, weigh, sample, and test the milk of each cow, and make accurate entries of all results in official tables drawn up for the purpose. From the results of these regular, periodical tests, calculations of the yield and quality of the milk for the whole lactation are made with fair approximation. When it is mentioned that in Scotland, alone, 37 recorders are constantly employed, some idea of the importance of this still comparatively new movement will be obtained. Some 30,000 cows are being regularly tested in this way.

All the figures of the recorders are subjected to revision by a central staff, and any necessary corrections are made. This part of the work alone, we are informed, is very great, and requires the regular employment of a considerable staff. But no effort is being spared to place the reliability of the records beyond question.

Milk records made in this way are of incalculable value to the owners of herds. Actual records are the only reliable tests of the relative profitableness of each cow in a herd. They accentuate in the mind of the farmer the difference between his good milkers and his poor milkers in a way which nothing else does, and indicate clearly how he may increase the profitableness of his herd as a whole by putting away certain of his poorer cows, and replacing them by better cows. They show that in many cases he would actually increase the profit from his herd by simply putting away certain of his worst cows, and not replacing them at all. By referring to the records, the owner knows definitely which cows in his herd are more likely to produce the better calves for stock purposes. So that by simultaneously drafting out the poor milkers and breeding up from the good milkers, a farmer may raise the average milk yield of his herd very considerably in a surprisingly short time. We are

informed that a number of the small dairy farmers in Scotland have actually increased the value of their annual output of dairy produce by over £100 from the same number of cows as formerly, and with practically the same cost of upkeep. Such an increase in the value of the produce alone, an average of over £3 per cow, is surely out of all proportion to the small monetary payment made by the farmer, which, we understand, is at present, under the national scheme, less than one shilling per cow.

There is the further advantage that a good milk record attached to a cow, when well authenticated, enhances her capital or selling value very considerably. A cow giving yearly 200 gallons of good milk above the average, is likely to throw a whole line of progeny, many of which will also be capable of giving an equally high yield of milk. Breeders realise this fact, and are prepared to pay handsome prices for heavy milking animals with an authentic milk record. Wherein lies the intrinsic value of an Ayrshire cow if it is not in its capacity to give a liberal yield of milk from comparatively cheap feeding, or to produce progeny with highly profitable milking qualities? It cannot be fattened profitably, and if it does not milk profitably it is of no use at all. But a healthy well-developed cow, passing the tuberculin test, with a good breed pedigree, and with a series of good, authentic, annual milk records, usually commands a very high price, well into three figures. There is an increasing demand for such cows in other countries where the native qualities of the Ayrshire breed are liable to deteriorate, and animals require to be periodically imported from the country of origin.

Some of the less progressive farmers still hold to the opinion that authentic records attached to a cow are not always desirable; that while good milkers are thus honoured, poor milkers are dishonoured. It is true that farmers who already own good milking herds are more enthusiastic because they see their superiority, while farmers with poor herds are discouraged by the inferiority of their cows. But surely light and guidance on any matter are helpful. It is the weaker links in a chain which most require strengthening. If the herd is a poor one, the sooner the owner realises this, and tries to improve the herd, the better for himself and all concerned.

Milk recording in Scotland on a public basis was inaugurated by the Highland and Agricultural Society in 1903, due to the initiative of the late Mr. John Speir, on lines previously followed in Denmark. A small grant of money was made to each group of farmers forming a local society for the purpose. A few years later the work was transferred to a special committee more representative

of those specially interested, termed the Ayrshire Cattle Milk Records Committee. The movement enjoyed a gratifying degree of success from the very commencement. A decided impetus, however, was given in 1912, when, for the first time, a substantial grant was made from national funds through the medium of the West of Scotland Agricultural College. But it was soon realised that the work must extend even beyond the confines of that part of Scotland served by this college. At the present time the work is benefiting from an annual grant of £2,000 from the Development Fund through the Board of Agriculture for Scotland. More extensive machinery of administration, under a body representative of agricultural interests in Scotland, termed the Scottish Milk Records Association, has been set up to carry out the work for the whole of Scotland. Every effort is being made to put milk recording upon a national basis as widely applicable and as reliable as possible. An annual grant of £50 is made to each new local society, and a smaller grant to each society after its second year. Besides this grant in money, which is designed to meet part of the cost of weighing, sampling, and testing the milk on the farms, the whole cost of administration, including the selecting of trained recorders, purchasing of all apparatus and supplies, supervising of recorders, checking of all entries and calculations, tabulating the results, compiling the permanent records, preparing the annual reports, certifying the yields, etc., is met from public funds. Farmers have now the opportunity of obtaining officially authenticated milk records for each of their cows for the ridiculously small monetary outlay of, in most cases, less than a shilling per cow.

The Development Commissioners evidently realise that it would be for the good of the whole country if the milking qualities of our herds of cows could be improved, and have agreed that this should be done partly at public expense. Dairy farmers ought, therefore, to make the most of their present opportunities in this direction. They would thereby not only act to their own advantage, but would secure the continuance of the grant, and also be in a position to claim an increased annual grant as the scheme developed. We in Scotland should realise, as they seem to do on the Continent, that farmers have a duty to the State as well as to themselves in this connection. If a farmer fails to make the most of his holding, the whole country is the poorer for it.—*The Scottish Farmer.*

How to keep Fowls Healthy.—To maintain fowls in a healthy condition should be the chief aim of every poultry-keeper. The number of eggs produced, the rate of development of the chickens, and the

quality and flavour of the flesh are all matters of extreme importance, but none is of equal importance to the maintenance of health. It is, as it were, the basis of the whole business. If fowls are unhealthy, they cannot possibly be profitable, and thus the claim that to maintain fowls in a healthy condition should be the chief aim of every poultry-keeper is, I think, fully justified. There are some who would have us believe that fowls are less healthy to-day than they were fifteen or twenty years ago, but with this I do not agree. Great improvements have been effected during the last few years in the management of poultry, and far more attention is nowadays devoted to the hygienic aspect of the industry than was the case previously. The result is that the poultry of this country were never in a better or a healthier condition than they are to-day. At the same time, there is still room for further improvement, and in the following remarks an attempt is made to indicate the lines along which this improvement may be made.

Even if fowls were less healthy to-day than formerly—which, however, is not the case—there would be some excuse, since so much more is expected of the modern hen. A hundred and twenty eggs per annum was considered a good average yield a few years ago, but unless upwards of a hundred and sixty eggs, and even more, are produced nowadays, the hen is regarded as belonging to a poor strain. This extra production means a tax upon the system, not only in the case of hens producing the eggs, but also in the case of the male birds, who have to fertilise so many more eggs than formerly.

Breeding from related parents is responsible for a great deal of illness, weakening, as it does, the constitution, and making the birds more liable to catch any disease that may be prevalent. Sometimes inbreeding is necessary, but whenever possible it should be avoided. In the making of a new breed, or of a new variety of an existing breed, or in the establishment of a new colour or special characteristic, it may be necessary to use related stock, but even in this case it should only be done by someone who is experienced in the matter and who understands thoroughly what he is doing. If it is done in an indiscriminate manner, the results are likely to be disastrous. The utility poultry-keeper has no excuse to inbreed, since he can always obtain new stock birds at a reasonable price. Inbred chickens are delicate and difficult to rear; their development is retarded, and they are liable to catch any complaint that happens for the moment to be prevalent. When adults they are usually poor layers, produce a large percentage of infertile eggs, and the chickens they throw possess all the faults of their parents, probably in an intensified form.

Over-feeding and unsuitable feeding are common causes of ill-health. It is no exaggeration to say that quite half of the fowls in this country are overfed, and this is especially the case with the laying stock, yet there is no greater mistake. Fat chickens are rarely so healthy, nor do they grow so quickly, as those in a lean and hard condition. Fat male birds do not fertilise the eggs in a satisfactory manner. Fat hens produce fewer eggs, while a large percentage of these contain no germ. No hard-and-fast rules can be laid down regarding the quantity of food to be supplied, since this varies according to the breed, the time of year, and the conditions under which the birds are kept. Some varieties require a much larger quantity of food than do others; hence, to say that a fowl must receive so many ounces of food per day may be quite misleading. An experiment which was carried out a few years ago showed that a Leghorn thrives well on about 5 ozs. of food per day, whereas a Brahma needs about 17oz. During the spring and early summer, when animal and vegetable growth abounds in the soil, a smaller quantity of artificial food is required. As a matter of fact, if the fowls have access to a good meadow, they are pretty well able to support themselves. The best thing to do is to examine them periodically; if they are too fat the rations must be reduced; if too thin they must be increased. Unsuitable feeding is also a cause of ill-health. For instance, a too liberal supply of maize or barley during hot weather causes all sorts of complaints.

A very common cause of disease among poultry is tainted soil. The ground is most likely to become foul when the birds are closely confined. When they have liberty to wander far and wide over arable and pasture land the danger is very slight indeed. So long as there is something to absorb the droppings the land will remain sweet. It is when the grass becomes worn that the great danger arises. Far better is it to keep a dozen fowls and retain the purity of the soil than to keep double the number and cause the ground to become tainted. Foul ground is a certain forerunner of disease, especially of gapes, tuberculosis, and liver disease.

Unsanitary housing is also responsible for a great amount of disease. It is more often ignorance than wilful neglect of the primary principles of hygiene that causes so much trouble. Want of ventilation is where most poultry-keepers err. The importance of fresh air cannot be too strongly emphasised, and very little experience is needed forcibly to bring this matter home to everyone. Oxygen is necessary, and if it becomes exhausted many are the troubles that inevitably follow, especially to the respiratory organs.

One's own common sense is the best guide as to whether the house is over-crowded, or the ventilation insufficient, since no hard-and-fast rule can be laid down. What would be right in one case might be quite wrong in another.—E. T. Brown in *Farm and Home.*

Kent or Romney Marsh Sheep.—I have been asked to give a *résumé* of the development of the demand for this breed of sheep during recent years, and some few notes upon the improvement that has been effected in connection with the Kent sheep during the period covered by its history since registration. With regard to the history of the breed as a pure race of sheep, there is no question but that it has existed in that category for many years. The records of various flocks published in the Flock Book take one back as far as the middle of the seventeenth century.

The adaptability of the Kent sheep to various climates and countries has long been recognised, for it was amongst the earliest of the British breeds to obtain a leading position in New Zealand, a country where it is at the present time one of the principal races, but limiting the scope of the reference to the period covered by the work of the Association, we find that this society was established in the spring of the year 1895, and right on from that time until the present there has been unbroken progression and increased popularity. Those of us who have been permitted to watch closely its gradual development and improvement can perhaps best realise the enormous amount of time, labour and care that have been ungrudgingly devoted to it by many breeders. Suffice it to say that, as time goes on, the visitors from the colonies and abroad, each time they come, state distinctly that they see a great improvement.

At this year's annual show and sale at Ashford, Mr. C. Elgar, of New Zealand, was most emphatic in his opinion as to the improvement in the evenness of the fleece. At the date of the foundation of the Association the breed was limited at the Royal Agricultural Society's Show, and one or two others, practically to two classes, with about three or four exhibitors, but during its exhibition career the breed has developed into the largest—or almost the largest—of any registered breed of sheep of this country, so far as Showyard representation is concerned.

In addition to this, those interested in the Romney sheep are alive to the importance of improving as much as possible the value of the fleece it produces, and they lose no opportunity of taking part in the competitions for the wool prizes. Its chief success was at the Royal Show at Bristol in 1913, when three lots of Romney Marsh wool won first, second and third prizes against fleeces from any

long-woolled breed in the country; and again at the Shrewsbury Royal Show last year the entry of Romney Marsh wool was larger than any other two breeds put together, and secured very high praise from the judge.

In addition to the encouragement given by the Association to the exhibition of sheep, it has been enabled, by the combination of interests represented by it, to establish one of the leading stud sheep sales of the world, which is now held annually at Ashford, and has been so held since the year 1897. The annual number of rams sold ranges from 520 down to 282. In the free registration days it was on rare occasions that a ram fetched 80gs.; a few, perhaps, realised 50gs., but since these sales have been held, and the breed has been exhibited widely at the various shows, prices have at private sales gone up to 400gs. for rams.

At the Association's sales held at Ashford the top price made there has been 170gs., in the years 1910 and 1912. The top price for the years 1907, 1913 and 1914 was 150gs. The highest average for an individual consignment was £59 7s. 6d., made in 1913. In 1910 another consignment averaged £48 7s. 9d., in 1907 one averaged £42, in 1912 one averaged £33 14s. 7d., and in 1914 £20 9s. 6d. for 49 rams. The highest general average of an entire sale was that made in the year 1913, when 357 rams brought a general average of £16 8s. 2d.; in 1905, 1906 and 1907, the averages were £10 0s. 9d. for 329, £12 5s. 8d. for 476, and £12 7s. 0d. for 410 respectively. In 1910 the general average was £13 1s. 10d. for 396, and in 1914 £11 0s. 9d. for 371.

In the first year of the Association's work, 113 rams only were exported. In the year 1914, despite the fact that during a greater portion of the period covered, the better customers of the breed were prohibited from importing sheep, no fewer than 507 rams and 244 ewes were exported. In the year ending August 31, 1913, 682 rams and 392 ewes were sent abroad. During the period since the Association was founded, 4,692 rams and 1,939 ewes have been exported.

There is no doubt that the main point in flock management is to take care of the lambs and do them well, for if the young stock are not properly cared for, it can soon be detected in the ewe flock. An old saying that well wintered is half summered, and well summered is half wintered, is quite true. To feed the ewes when carrying the lambs, and feed the lambs as soon as they will come to the trough, are the main points in the management of a pedigree flock. Thousands of Romney Marsh sheep never taste artificial food from the time they are born until they go to the butcher, and

with quite good results. Yet, if a flockmaster is desirous of breeding good stud sheep, he must look after the lambs and see that they are always thriving, as there are seasons, owing to climatic conditions, when the mortality is high amongst the lambs if they are not properly managed.

The custom with a great many Romney Marsh breeders is to lamb their ewes down in April, wean the lambs at the end of July or early in August, and send them into Surrey, Sussex, and other counties for the winter, with no artificial food, and, owing to the hardiness of the breed, as a rule they do well. They come back in the following spring looking perhaps rather lean, but very healthy, and as soon as they get back to their native pastures (Romney Marsh) they fatten very quickly and produce excellent mutton.

Where the sheep are brought up in this natural condition, they can hold their own in almost any climate, and I feel sure that the Romney sheep has a good future before it.

With regard to crossing the Romney Marsh ewe, I have no hesitation in saying that the best cross is the Southdown. If fed entirely on grass, these half-bred lambs (many of which are sold as fat lambs) make tip-top mutton as yearling sheep, and are very hardy. However, the Hampshire Down ram is used to a great extent, and many farmers who come from other counties buy them in preference to the Southdown cross on account of getting greater size. These are chiefly fed on arable land after weaning, and sold to the butcher at about nine to eleven months old, with carcases weighing from 70lb to 90lb.

Finally, I may mention that the majority of breeders are aiming at getting the pedigree Romney as uniform in fleece as possible, well covered with wool, possessing good bone and a hardy constitution.—J. E. Quested in *Farmer and Stockbreeder Year Book.*

Growing Big Cereal Crops.—The following extracts are taken from a lecture recently given by Dr. Bernard Dyer to the Bedford Chamber of Agriculture :—

The average yield of the wheat-land of England was generally estimated at about 33 bushels. No doubt among that wheat-land there was a good deal which was yielding as much as the climatic conditions would allow, but there was also a great deal that was not nearly so productive as it might be. Indeed, the yield could easily be increased 5 bushels all round if it were treated to the maximum extent from a manurial point of view. There had been many sad years for growers of wheat when it was not worth while to spend money on its treatment, because the value of the increase was not greater

than the cost of the manures that produced it. But that time had gone by, and now there was every inducement, owing to the good prices that wheat realised, to get as much as was possible out of the land. With increased grain there was increased straw, and in that way there was an increase in the fertility of the farm.

In going about the country he was often struck by the many fields that were patchy in their productiveness, where it was obvious that the land on the whole was not producing all that it was capable of doing with proper treatment. There were fields of thin wheat, with here and there patches of splendid growth, where the horse had helped during ploughing, showing the capability of the land. He would take, first, wheat coming after clover. Following a heavy clover crop, speaking generally, wheat did not want much additional help, because clover enriched the soil, the roots decaying and acting as a nitrogenous manure. Even where a heavy clover crop had been sown the previous season, it might be desirable, in order to make the most of the wheat that followed, to dress the land with phosphates so as to enable the wheat to make the best out of the nitrogen which the clover had left behind. On any such land where wheat had been put in, he would suggest that it would be wise, and not expensive, to sow a couple of hundredweight of superphosphate in the autumn or early winter. When the clover was scanty or the land previously sown with seeds or rye grass and clover mixed, it was advantageous to give a spring top-dressing of nitrate. Wheat might come after beans; in that case, if the beans were put in with a good dressing of dung, phosphatic manure might be dispensed with on most land. If no dung had been used then the wheat should receive a dressing of phosphate. Wheat might follow roots after fallow. In that case a good deal of time would have elapsed since the phosphates were put in, and much would depend on what the roots were and how they were treated. If wheat followed a fallow, after mangels, and the mangels did not receive much of a phosphatic dressing—for they did not need it so much as turnips—then the wheat, if the most was to be made of it, should receive a good phosphatic dressing either before sowing or shortly afterwards. Wheat might follow wheat, and that was a case where it was not only desirable, but in most cases imperative, that it should be well treated, if good results were to be depended on. As regards the various methods of giving a phosphatic manure in the winter. On some land it might be preferable, before any lime was used, to use basic slag which should be ploughed into the land before the crop was sown. If they had neglected to put in phosphates before sowing, as wheat was a deeply-rooted crop, a dressing of superphosphate

should be given as soon after as possible, the quantity depending on the strength of the superphosphate; if the ordinary 25 per cent., the dressing might vary from 2 cwt. to 4 cwt., according to what the crop came after.

The most important thing, however, was nitrogen manuring in the spring; that was the real key to the situation. In the case of a wheat crop, phosphate alone would do no good at all. Wheat, if the land were in fairly good condition, could often get as much phosphate as would suffice. Occasionally people not used to top-dressings tried nitrate of soda, but found that the crop showed a deficiency in some respects. Probably there was too much straw, or the ears were thin, and in following up a case like that it was probably found that it was due to relying solely on the nitrate without a backing up with phosphates. Sulphate of ammonia might take the place of nitrate of soda on some soils; indeed, on some it was preferable, and then again it was sometimes well to use the two, sulphate for the first dressing, and nitrate for the second. On heavy clay land, such as was to be found in Bedfordshire, soot was a very useful form of nitrogenous top-dressing. In addition, it exercised a beneficial mechanical effect on the land, which would plough all the better the next year. Where sulphate of ammonia was used in place of nitrate of soda, it might be estimated that about $\frac{3}{4}$ cwt. of sulphate of ammonia contained as much as 1 cwt. of nitrate of soda, but, taking one thing with another, 1 cwt. of the one was much the same as 1 cwt. of the other, as the nitrate was usually a little more effective. With regard to soot, its weight and composition was variable. One cwt. might contain from 5 to 8 bushels. Generally speaking, then, 20 or 30 bushels—which was not an uncommon application—would weigh about 4 cwt., of which 1 cwt. should consist of sulphate of ammonia. This would be good soot, however; a great deal consisted of ashes, and from time to time he received samples which were little more than flue dust, and contained very little real soot. Such soot was worthless. As a rule, the lighter the soot the better.

As he had said, after a clover crop wheat should not want a top-dressing, but when only a moderate crop, or after seeds, $\frac{3}{4}$ cwt. of nitrate of soda should be given, or its equivalent in other nitrogenous materials. Where wheat followed roots and fallow, particularly carted roots, the quantity of top-dressing could, with advantage, be increased to 2 cwt. of nitrate of soda. The hungriest wheat crop was that which followed another straw crop, and when wheat followed wheat 2 cwt. of nitrate of soda or sulphate of ammonia should be given. It should be put on in two dressings, one cwt.

in February or March, and the other a few weeks later. There was some land on which 2 cwt. of nitrate of soda was said to produce stickiness. That might be remedied by first using 1 cwt. of sulphate of ammonia and later 1 cwt. of nitrate of soda; the action of the one balanced that of the other. On very light land it was not always desirable to rely solely on nitrate of soda owing to the possibility of its being washed away. There was not much danger, however, as slight showers only served to take it down, and the dry winds forced it up again. Now that wheat was at a good price, it might be profitable to apply Peruvian guano. When wheat was at a lower price than now, guano was an expensive luxury. It was rather extravagant to give dung to wheat, because wheat was one of those crops that could be fed entirely with artificials; therefore, it was best to keep farmyard manure for mangels, beans, etc.

Barley could not be treated with the same lavishness as wheat, but the yield could be increased by liberal artificial dressings. They should be careful, however, not to injure the quality. On some land the best barley was grown after a well-manured wheat crop, without further manuring. When barley came after roots much depended on whether the roots were manured and what became of them. If the roots were well manured with superphosphate and fed on the land, barley would, as a rule, be independent of artificial dressing. If the roots were carted, a dressing of phosphate should be given. They also had to consider whether it was light or heavy land, containing plenty of lime, or a short supply. If rich in lime, superphosphate was cheapest and best, a good dressing being from 2 cwt. to 3 cwt. per acre, according to quality. If slag were used, from 4 cwt. to 5 cwt. should be employed. Barley should have enough phosphate, as it was a shorter-rooted crop, and did not search the ground so well as wheat. Neither was it long in life, and even in ordinary times, when the price of grain was less, it would still be economical to give phosphates to barley. On light land superphosphate and potash should be used. Unfortunately they could only talk of potash salts now, as the supply from Germany was stopped. In their absence, when a top-dressing was required, nitrate of soda should be used in preference to other nitrogenous manures, as its soda partly replaced potash, although in normal times potash salts should be used. Barley grown after wheat needed a top-dressing; 1 cwt. of nitrate of soda was sufficient, for on fairly heavy soil there was a quantity of potash in the land. Other land required nitrate of soda and sulphate of ammonia to be mixed; it was not a bad idea to use ½ cwt. of each as a top-dressing. It was largely a question of soil.

Oats may be manured very much more heroically than barley. Experience taught that it was difficult to over-manure them. It was possible to increase the yield of oats by the use of artificial fertilizers far more than many people realised. Magnificent crops followed mangels or cabbages if they had been well manured. If mangels and cabbages were treated with a nitrogenous manure, and further with phosphates, there was a good deal of value left in the ground for the oats that came afterwards. If the previous crops were heavily manured, oats could be grown without any further application of manure. However, in the absence of a previous heavy manuring, after roots had been fed off, a couple of hundredweights of superphosphate, followed up with a top-dressing of nitrate, should be employed. If the mangels had not been manured and had been carted, then for oats 2 cwt. of nitrate of soda could be applied with advantage. Two cwts. of nitrate of soda, provided it was used in conjunction with phosphates, produced a most profitable increase in oats on land which for wheat could not be so heavily manured.

Milk Records.—From time to time, attention has been drawn in "The Note Book" to the value of Milk Records, and the following extract from a Report of the work done by the Nottingham and District Milk Record Society may prove of interest as a definite statement of facts and not of opinions. The Report was drawn up by Mr. P. W. Bailey, N.D.D., who was the Recorder appointed to carry out the work for the Midland Agricultural and Dairy College.

The Society consisted of 18 members, and was conducted upon practically the same lines as the Ayrshire schemes, which have done such useful work. The milk of each cow was weighed once weekly —evening and morning—by the farmer, whilst the Recorder paid monthly visits to the farms to check the weighings. The cost of production of the milk also received attention—the Recorder weighing the foodstuffs and giving advice as to the alteration of rations, if necessary. To estimate the cost of feeding it was necessary to fix an arbitrary price per ton for home grown foods—other foods being taken at current market prices.

The prices fixed were :—

Hay	£3	0	0	per ton.
Oat Straw	1	15	0	,,
Barley	1	5	0	,,
Mangolds	0	12	6	,,
Swedes	0	10	0	,,

The lowest cost per day of rations was 1s., but in this case there was a deficiency of albuminoids; and the average yield per cow worked out at 1·6 gallons. In several cases an excess of roots was given, over the requirements of the animal. The same applies to the feeding of hay—it was in many cases difficult to estimate the quantity fed—if there was a good supply at hand the cows may have received some pounds more than in other cases. If hay is given too excessively, the ration becomes wasteful and expensive. One of the most satisfactory rations included wet brewer's grains; the cost per day worked out at 1s. 1½d., and cost per gallon of milk at 5¼d. Where wet brewers' grains were given, the milk yield was higher than in herds where they were not used, though, in herds where an excessive amount was given, the cattle were not in first-class condition, and would, no doubt, suffer from the continuous use of the grains.

If not more than 20lbs. per day of wet grains were given, especially in conjunction with decorticated cotton cake or meal, the results were very satisfactory, the cost per gallon of milk working out at less than on farms where grains are not included in the ration.

In estimating the cost of the production of milk, nothing was allowed for attendance on feeding of the cows—but the manure obtained may be considered as an equivalent—this method being generally accepted.

In one or two cases the farmers were found to be using excessive amounts of concentrated foods, no doubt with the idea that the best feeder is he who uses the greatest quantity. In one instance 6lbs. of Linseed Cake was being fed—besides other things, of which Cotton and Compound meals may be mentioned. The milk produced cost 8½d. per gallon, the daily ration 1s. 8¼d. The Linseed Cake was afterwards gradually reduced by about half, without affecting the milk yield. Farmers who made variations in the rations were usually found to be the better off. Any changes must, of course, be carefully made; that is, any ingredient, the use of which is discontinued, must be replaced by an equivalent in feeding value, due regard being paid to the palatableness of the substituted food.

The lowest cost of daily ration was 1s., but the cost of production of milk does not work out the lowest also. The following results are interesting :—

		s.	d.
Maximum cost per gallon of milk	..	0	8½
Minimum " " "	..	0	5¼
Average " " "	..	0	6¾
Heaviest yield of milk per cow	68 lbs.		

		s.	d.
Highest cost of daily ration ..	..	1	8½
Lowest ,, ,, ,,	..	1	0
Average ,, ,, ,,	(nearly)	1	6

It is interesting to note that the milk from the farm on which the most expensive ration was given was no richer in fat than that from the farm where the cheapest one was given, though the cows in the former herd were in the best condition.

The poorest milk was found in the month of June, and the richest in November. The individual sample of milk found to be richest in fat was given by a cross-Shorthorn cow, in December. It tested 5·3 per cent. fat in the evening's milk; the cow had calved six months, and was giving two gallons daily. The record total yield of milk per cow was 1,312 gallons. It was this animal which produced the heaviest yield in one day, namely, 68lbs. The heifer which produced the biggest total yield gave 713 gallons, and it is pleasing to note that several others approached that figure.

The Valuation of Feeding Stuffs.—In a valuable paper, originally contributed to the "Journal of the Royal Lancashire Agricultural Society," but since reprinted in pamphlet form, Mr. A. Smetham, F.I.C., F.C.S., fully discusses this important subject, and we select a few extracts which are of universal interest to farmers. The author says:—

By chemical analysis it is possible to resolve any given food into its proximate constituents and to determine within narrow limits the exact percentage of each ingredient present. In every food upon the market, water is present to a greater or less extent, and up to a point must be regarded as a natural and necessary ingredient. If the amount of water exceeds 13 per cent. or so, it is objectionable on account of the tendency of wet foods to 'heat' and become musty on storage.

Very few of the grains, or seeds, or other foods, as offered on the market, are free from chaff or dirt. In some cases the dirt can be, for the most part, removed by washing, screening, etc., but, in the case of imported cakes and meals, such treatment is practically impossible, and they must be bought on their merits. Although there is no legal standard for the percentage of sand or dirt in feeding stuffs, there is a pretty general consensus of opinion that so long as the sand present does not exceed 2 per cent., little or no risk is involved in the ordinary use of such foods: but, if it exceeds that amount, the food should be used with caution and generally in conjunction with other foods, so as to bring the total sand in the ration well within the 2 per cent. limit. With the exception of

the water and mineral matters, natural and extraneous, all foods without exception consist of organic matters. These organic compounds consist of :—

(1) Oil or fatty matters.
(2) Albuminous compounds—sometimes stated as Albuminoids or Proteids.
(3) Digestible or Soluble Carbo-hydrates.
(4) Woody fibre.

Oil or Fatty Matters.—All animals and most vegetable substances contain more or less oil or fat, the exact character of which varies with the source from which it is obtained.

All oils contain a relatively large percentage of Carbon and Hydrogen and only comparatively small quantities of Oxygen, and in their ultimate composition do not vary to any marked extent. When burnt, most of the Carbon and Hydrogen are free to combine with the Oxygen of the air and will produce, therefore, more heat than other organic compounds containing less Carbon and more Oxygen.

From direct experiments it has been found that when completely burnt the heat produced by one part of Fat is about equal to that produced by 2·4 parts of Starch or 2·5 parts of Sugar.

Fats and Oils, being quite devoid of Nitrogen, are unable to form any part whatever of the muscular system of animals, but they are able to supply the heat necessary for the maintenance of the body, and the energy required for work, and, after these requirements have been satisfied, any portion not so utilised can be stored up in the body in the form of fat.

Whether utilised for maintenance, employed as energy, or stored up in the form of fat, it may fairly be assumed that the fats are worth approximately two-and-a-half times their weight of Starch and Sugar. The term Albuminous is derived from Albumen, the white of an egg, one of the most familiar bodies of that class to which it has given its name. Like the fats or oils, there are a considerable number of compounds differing in physical and chemical constitution included under this head; but they all resemble one another in one respect, viz., that, in addition to Carbon, Hydrogen, and Oxygen, they all contain Nitrogen in approximately the same proportion. Muscle, nerve, and the greater part of the solid matter of blood consist of Albuminoids, while horn, hair, woól, cartilage, bone, the casein of milk and some other animal products contain Nitrogenous compounds which have to be produced from the digested Albuminoids of the foods consumed.

Any food, therefore, to be a complete one, must contain sufficient digestible Albuminoids to build up the various parts of a growing animal enumerated above, and, in addition, must supply sufficient Albuminoids to repair the waste in the body of the Nitrogen compounds, which by exercise and respiration are burnt in the body and transformed chiefly into a much simpler Nitrogenous compound—Urea or Uric Acid—which is chiefly eliminated by the kidneys in the form of urine.

In rations, if the proportion of Albuminoids to fats and Carbo-hydrates drops below a certain well-recognised point, a partial starvation of the animal will occur, and feeding cannot be profitably carried on.

Digestible, or Soluble Carbo-hydrates, are sometimes simply described as Carbo-hydrates. Under this head, a large number of substances, varying very much in chemical and physical composition, are included; but, with some slight and for practical purposes negligible exceptions, the whole of the members of this group resemble one another in so far as they are compounds of Carbon with Hydrogen and Oxygen, the two latter being present in the same proportion as in water, hence the name Carbo-hydrates. They are very valuable constituents of most foods, and are primarily useful in maintaining the body heat, and, when given in excess of what is required for this purpose, a portion may be stored up in the body in the form of fat.

The most common examples of Carbo-hydrates are Starch, Sugars, and Gums.

Woody fibre is variously described as indigestible woody fibre, cellulose, crude fibre, etc. Formerly, it was assumed that this portion of the food was indigestible; but subsequent research has shown that this is not strictly correct, and that, as a matter of fact, a portion of the woody fibre is capable of digestion, and to some extent can act as a food, but the amount of energy employed in masticating and digesting it is so great that the effective food value of what is digested is very small.

The choice of purchased feeding stuffs should be determined by their relative feeding value, and the market price.

Although there is an increasing tendency for all recognised feeding materials to approximate to one standard price per 'Food Unit,' there are still wide differences in the price of foods upon the market, and it is, therefore, very desirable to have some simple system which will enable the purchaser to determine which, of a number of foods, is relatively the cheapest. With this object in view, two methods have been suggested, neither of which can be

regarded as perfect, but, since they both afford comparisons of the feeding value of foods widely differing in composition and in price, they form a useful means of computing the relative values. The two methods are:—

(1) By "Food Units."
(2) By "Starch Equivalents."

(1) By 'Food Units.' To estimate the relative values of foods by this means from their chemical analysis it has to be assumed that the valuable constituents of all the concentrated foods which the farmer usually buys, and to which this method of valuation would be applied, are of equal digestibility; and it is also assumed that the various constituents, Oil, Albuminoids, and Carbo-hydrates, have respectively the same value from whatever source they are obtained.

It is further assumed that the woody fibre is without feeding value, and that the Fat and Albuminoids are both of them equal to two-and-a-half times their weight of Carbo-hydrates. None of the above assumptions can be regarded as scientifically accurate, but, nevertheless, I venture to say that, for general use and ready reference, valuation by means of 'food units,' is the simplest, and, if not the most accurate, at least the most handy, method we possess of comparing the relative values of purchased foods, whether from similar or different sources.

(2) By 'Starch Equivalents.' By this method of computation an endeavour is made, as in the case of comparisons by means of 'food units,' to express by a single figure the relative values of given foods.

Since the relative values of foods may be gauged by the productive increase in fat which is observed when a given weight of food is added to a diet just sufficient for the maintenance of an animal, it was decided by Kellner to take this as a basis of his calculations, and since all the nutrients of the added food contribute directly or indirectly to the increase in body-fat, experiments were made first to ascertain the increase produced by pure starch, and then to determine, under similar conditions, the effects of equal weights of the other foods under examination. The general method adopted will be made clear by an example given by Kellner in his book:—

> "Suppose an experiment with ruminants has shown that 100 Kg. of fairly good meadow hay forms 8 Kg. of body fat when added to the maintenance ration. In a similar experiment where starch was fed instead of meadow hay, it was

found that the weight of fat gained was exactly equal to a quarter of the starch given. If the 8 Kg. of fat obtained from the hay be multiplied by 4, the quantity of starch which would have the same effect as 100 Kg. of the hay is obtained, that is 32. This figure 32 is then the starch equivalent of the meadow hay. This does not in any way mean that the meadow hay contained 32 per cent. of starch, but expresses the food value of the hay as compared with starch."

It will be seen that to arrive at the 'Starch Equivalent' of any food a series of rather complicated calculations have to be made, which, I am afraid would prove puzzling to many British farmers.

Another objection to the use of 'Starch Equivalents' from the purchasing point of view is that the method relates only to the feeding values of different foods and takes no cognisance of the residual values of the foods as manure. Any system for the valuation of purchased foods which disregards the manurial value is, in my opinion, faulty; and, as the question of money value is the one which dominates a farmer's decision in purchasing, I opine that, for general practical purposes, the estimation of the value by 'Food Units' is better suited to the needs of the English farmer than the more elaborate system of 'Starch Equivalents.'

The prices of Feeding Stuffs, like all other commodities, fluctuate according to the laws of supply and demand, but that foods from such diverse sources when brought to the unit standard should in most cases approximate so nearly to the values as indicated by their 'food units' is in itself a justification of my contention that for practical purposes the valuation by means of 'food units' is not only reliable but commercially sound. The demand for the various feeding stuffs must to a large extent be based upon the general consensus of agricultural opinion as to their feeding value and cannot be regulated by any consideration of the composition. That the selling prices of the different foods should so nearly follow the 'food units,' as calculated from the analyses, shows that farmers generally have by practice arrived at very sound conclusions as to the relative feeding values of the foods, and this confirms me in my opinion that for practical purposes the value of a food may be calculated from the total analyses without complicating the calculations with considerations of its digestibility, etc.

Hints on Dairying.—There is no article of food more necessary to our large population than good sound milk. To obtain this, Acts of Parliament have been passed and many officials employed, and, on the whole, milk, as supplied to the public of Great Britain, is of very fair quality.

One of the first necessities for the production of good sound milk is a clean, well-ventilated byre, with plenty of light, and the ventilation and cleanliness of byres is now much better than it used to be. The most modern system of ventilation is by means of a number of hinged glass windows at the apex of the roof. These windows are moved by levers from below, and the opening can be regulated according to the weather. Either side can be opened at will. In addition, air is admitted to the byre by means of pipes in the wall about the level of the cows' heads. With this system of ventilation it is necessary to have a large wide rhone running the whole length of the byre under the ventilator to catch the rain, which is liable to come in as the ventilator opens right at the top. This system of ventilation ensures a constant current of fresh air, and also admits a great deal of light. It is, however, expensive to put in, and a cheaper substitute can be found by cutting two to three feet off the top of the roof, putting a raised ridge all the way along, and having the drain tiles in the wall below. No rhone is required below in this case, as the overlying ridge allows the rain to run off. If, in addition to this, there are a sufficient number of skylights that will open, it ensures a very light, well-ventilated byre. The drawback to this system is that it does not admit of any regulation. Much, however, can be done by an intelligent use of what means of ventilation we have, even when this is far from perfect. The writer knows a very fine herd of deep-milking cows which have their abode in an old-fashioned byre with very deficient ventilation, and, nevertheless, are entirely free from tuberculosis. Their owner has accomplished this by ensuring that the cows spend as much of their time in the open air as possible, taking weather conditions into consideration, and also by making a judicious use of open doors.

Cleanliness of the byre is also of the greatest importance. In winter, a well-kept byre requires to be cleaned three times a day, and washed twice. In summer it should be cleaned twice and washed twice. A liberal use of water has a great effect in keeping a byre free from odours and germs. The troughs should also be kept scrupulously clean, and care taken that no remains of boiled food lodge in the crevices. In addition to this, it is a good thing to spray the roof occasionally with a disinfectant, and to whitewash the wall by the cows' heads once every month or six weeks. Cleanliness in the byre, in addition to promoting the production of sound milk, plays a great part in keeping a dairy herd free from disease. Thirty to forty animals kept under one roof run a tremendous risk of infection. Strict attention to cleanliness

renders these risks very much less. Drains should also be carefully looked after, and in dry weather regularly flushed with a disinfectant. All drains should be led outside the byre and run into traps there.

The cow is a cleanly animal and suffers very much if kept in a dirty condition. Grooming should be part of the regular routine of the byre and will amply repay the time spent on it, both by the improved health of the cows and by the increased cleanliness of the milk. No part of the cow harbours more germs than the tail, and if the cow is to be kept in clean condition the tail must be washed with hot water, soap and soda at least once a week. Much can also be done to keep cows clean by a proper use of bedding. Here in the West of Scotland straw is often scarce, and many a time the cows have a very bare bed. While a careful use of straw is very admirable, it is a great mistake to give a cow a poor bed. No man can do a good day's work if he has not rested well the night before, and no cow will give as much milk as she might if she has slept on a bed of hard cement. So strong is our personal feeling in this matter that we would rather slightly curtail a cow's ration of meal than condemn her to a poor bed.

Every care should be taken that the operation of milking is carried out in a cleanly manner. Milkers should wash their hands thoroughly before commencing to milk and should use a nail brush. Special garments should also be kept for milking and should be regularly washed once a week. It is advisable that the farmer should own and wash these garments. Milking stools should also be regularly washed. There is no means by which milk can be more readily contaminated than by grasping a dirty stool with the hands in moving from cow to cow, and then starting milking. At the best, hand milking falls far short of machine milking in so far as cleanliness is concerned. There is something very attractive in the idea of the milk passing from the teats through tubes into a closed vessel, and so enabling it to be removed to the dairy without coming into contact with the air of the byre.

Perhaps nothing plays a more important part in the dairy than a good supply of pure water. This is necessary both for drinking purposes for the cows and for the washing of milk dishes.

Too heavy feeding, in the case of a breeding stock, is not advisable, as it tends to make the cows break down at an early age. In practice we have found that about 6 lb. of meal per day is a sufficient ration for an Ayrshire cow when combined with a liberal allowance of turnips and hay. Ideas on the feeding of cows have changed very much, and it is not now customary to give the meals to the cows

in the very fluid mash of some years ago. A much thicker mash is now used, and many stomachic troubles are thereby avoided. Having considered the best means of producing a supply of good milk from a herd of healthy cows, we may now pass on to the building up of a herd of deep-milking cows.

Nothing has done more for dairy farming than the establishment of milk record societies. Formerly the milk yield of cows was almost wholly guessed at, and farmers, although they usually knew their best milking cows, had little idea of how poor their worst were. The average yield of an ordinary Ayrshire cow, such as you can buy at any auction mart, is about 600 gallons per annum—often less. But in many herds the average, by breeding and selection, has been brought up to 700 or 800 gallons, and one herd we know of has reached the high average of 900 gallons. If one can increase the yield of a herd of thirty cows by 50 gallons per head it means, at the price of 6d. per gallon, an additional profit of £37 10s. It is unquestionably a great advantage to have the milk yield of the herd properly tested by the official tester, and a record kept of the butter fat as well as of the weight of the milk. If, however, one cannot join a milk record society, it is a simple matter to buy a proper balance and pail and to weigh the milk of each cow at regular intervals, keeping a note of the quantity. I am certain there is no way in which the farmer can so easily increase the profit from his dairy, for he is thus enabled to weed out the cows which are least profitable. By keeping a bull whose pedigree is strong on milk record lines, and which is certified free from tuberculosis, and mating him with the best milking cows, you have a chance of getting calves which will excel their mothers as milkers. This is one of the best means of improving the milking properties of the herd. Of course, it takes time, but it is the only way open to the ordinary farmer, as queys whose dams have a good milk record command a high price. Too great care cannot be taken in purchasing a bull, and it is a mistake to sell too soon a bull whose mother has a good milk record and which comes from a good herd. Many of the more advanced breeders who are buying high-priced bulls keep them for years. We recently saw a bull, whose age was thirteen years, in the byre of a noted prize-winner. Where milk commands a good price, say from 9d. to 1s. per gallon, calves are expensive to rear, and at first sight it may appear unprofitable. But one can rarely buy at a moderate price so good an animal as one can rear. Those who have had experience both of buying in the open market and of bringing in queys of their own rearing know well that the latter is by far the more profitable system.

The rearing of calves requires the greatest care and attention and should always be undertaken by a responsible person. It is desirable that calves should have new milk for at least a month and then be gradually put on a substitute. One of the best and most easily handled substitutes is separated milk and cod liver oil, starting with one dessert spoonful of oil added to the separated milk at each meal and increasing to one tablespoonful.

At no time has the development of dairy farming been more important than the present. Recent events have caused us to consider how much of our food we can produce in our own country, and the farmer has not occupied so important a place in the eye of the nation for many years. We have thus very forcibly brought before us the importance of increasing the milk yield of our herds by every means in our power, and we would again emphasise the fact that breeding from the best milking cows, combined with healthy housing in clean, well-ventilated byres, is the best means of doing so.—" C. B. B." in *Scottish Farmer Year Book.*

The Bacterial Treatment of Peat.—If the statement be true that "the soil is the basis of national wealth," the problems of soil fertility and plant production are not merely of interest to farmers and gardeners, they are of national importance.

The question of food-supply has always been one of the dominant factors of man's existence. As time goes on and populations increase and their needs become greater, this question of food supply will become more and more acute. Some writers have already given us terrifying pictures of this food famine of the future. But man's necessity is science's opportunity, and the comparatively new science of bio-chemistry is already indicating methods for increasing crop production which, if utilised, will enable the race to produce all the food material required for many generations to come.

In early times the subjects of soil fertility and plant growth were thought to be quite simple. It was held that plants derived all their nourishment from the humus of the soil, and this when exhausted was replenished by manuring with dung and other organic materials.

This "humus" theory was replaced about the middle of last century by Liebig's "mineral plant food" theory. He stated that plants obtain their carbon from the carbonic acid in the air, and their necessary ash constituents from inorganic salts in the soil. Soil fertility could be maintained solely by the addition of mineral fertilisers. This theory, with certain modifications, is generally accepted at the present time, and is seen stereotyped in the Fertilisers

and Feeding Stuffs Act, where nitrogen, phosphates and potash are the only factors considered in a manure.

But during recent years evidence has been rapidly accumulating that the organic matter of the soil with its myriads of bacterial inhabitants is the most essential factor in soil fertility.

Organic matter, whether of animal or vegetable origin, when mixed with the soil undergoes decay, some portions rapidly, others slowly, resulting in the production of the dark material known as "humus." This material provides food and energy for numerous soil bacteria, and is gradually converted by them into substances suitable for plant food. These bacterial activities not only produce nitrates and other food substances, but they also render the mineral food constituents of the soil available for plants. Thus a "new humus" theory of soil fertility is gradually evolving as a result of modern research.

The parts played by the different kinds of bacteria found in the soil have been the subject of much investigation in recent years. Amongst these, the nitrogen-fixing bacteria are perhaps the most important, for by their activities they can assimilate free nitrogen and add to the soil an increasing store of this essential element in a combined state.

The great discovery by Hellriegel and Wilfarth in 1886 of the relationship between leguminous plants and the "nodule" bacteria, and the demonstration by Beijerinck in 1888 that the bacteria in these root nodules can absorb gaseous nitrogen from the soil air and combine it with other elements into introgenous food material, was followed in 1900 by Nobbe and Hiltner's preparation of pure cultures of these "nodule" bacteria for soil inoculation. High hopes were entertained that soil inoculation for leguminous plants would result in greatly increased crops, and thus solve in part the problem of nitrogenous manuring. Unfortunately, these hopes failed of realisation, for, although on certain poor soils inoculation has been attended with good results, it has to be admitted that on ordinary soils inoculation is useless for increasing the growth of leguminous plants.

In addition to the "nodule" organisms there are other nitrogen-fixing bacteria found in the soil, independent of any host plant. These live in the soil itself, and develop there even when no crop is growing upon it. The most important group of these free nitrogen-fixers is that discovered by Beijerinck in 1901, and named by him "Azotobacter." They are large ovoid forms, aerobic in habit—that is, they live only in the presence of air—and they are widely distributed in all fertile soils. Their power to fix atmospheric

nitrogen is more pronounced than that of any of the other nitrogen-fixers, and it has been stated that "Azotobacter, by its relative abundance, indicates what may be termed the natural nitrogen-recuperative power of a soil."

Azotobacter can be cultivated quite easily in the laboratory, in culture solutions containing sugar and the necessary mineral salts but no nitrogen compounds; and it can be demonstrated by analysis that considerable quantities of atmospheric nitrogen have been fixed after ten to fifteen days' growth. Here again there was the prospect of utilising these cultures for soil inoculation, and thus directly increasing the nitrogen content of the soil, but in spite of numerous experiments and attempts in this country, Germany and America, only negative results were obtained.

Recognising the undoubted capacity which Azotobacter possesses to fix appreciable quantities of free nitrogen, it was felt that if only a suitable medium could be obtained it ought to be possible to introduce the organism into the soil with beneficial results, and it was with this object in view that a series of research experiments were commenced in the Botanical Laboratory, King's College, three years ago.

It was evident from the failures of previous investigators that a liquid medium was useless. The natural home of Azotobacter is not in a liquid but in soil, where in the presence of air it obtains its food and energy from the humus. Heinze, Krzemieniewski, and others had already shown that soluble soil humates exercise a remarkable stimulating action on the fixation of nitrogen by Azotobacter. Hence the problem was to find a medium rich in soluble humates. Numerous substances containing humus were tried, but all without success. Finally, experiments were made on peat. Natural peat is rich in humic acid, and it is well known that this humic acid can be converted into soluble humates by the action of alkalies such as potassium hydrate, sodium hydrate and ammonia. It was very soon evident, however, that peat treated with these chemical substances was useless for Azotobacter. The organism refused to grow in such a medium. Then, by a more or less happy chance, it was discovered that certain aerobic bacteria possess the power of converting natural peat into a "humated" neutral medium in which Azotobacter flourishes well if the "humating" bacteria are killed off by sterilisation before the culture of Azotobacter is added. Hence the preparation of the treated or bacterised peat consists of three stages—first, the raw peat is moistened with a culture solution of the special "humating" bacteria, and the mass kept at a constant temperature for a week or ten days; during this

time the bacteria act on certain organic constituents of the peat, and gradually convert a large amount of the humic acid present into soluble humates; second, the "humating" bacteria having done their work are destroyed by sterilising the peat by live steam; third, the sterilised peat is treated with a mixed culture of nitrogen-fixing organisms—*Azotobacter chroococcum* and *Bacillus radicicola*—and after a few days' incubation at 26° C. is ready for use.

The following table shows the effect of the treatment as proved by analysis:—

	Soluble Humate. per cent.	Soluble Nitrogen. per cent.	Total Nitrogen. per cent.
Raw Peat	·028 ...	·214 ...	1·267
Bacterised Peat ...	15·194 ...	2·694 ...	4·310

Ordinary soil when mixed with bacterised peat shows a striking increase in nitrogen content if the mixture be kept at the temperature most suitable for the growth of Azotobacter. In order to test how far this increase was due to the nitrogen-fixing organisms introduced in the peat, mixtures of garden soil and bacterised peat were made in the proportion of 9 ozs. of soil to 1 oz. of peat, the peat in one being sterilised, thus killing off the nitrogen-fixers present. Each mixture was placed in a large bottle, and remained in an incubator for seventeen days at a temperature of 26° C. The contents were then analysed, with the following results:—

	Grm. N. per 100 grms. soil.		Average.
Soil + sterilised bacterised peat	(a) ·416 (b) ·417	...	·417
Soil + active bacterised peat (at commencement)	(a) ·419 (b) ·410	...	·415
Soil + active bacterised peat (at end)	(a) ·474 (b) ·476	...	·475

An average gain of 60 mgrms. of N. per 100 grms. of soil.

If this increase of nitrogen could have been obtained throughout an acre of soil for a depth of three inches, it would represent the equivalent of a dressing of 28 cwts. of nitrate of soda per acre, taking nitrate of soda to contain 15·6 per cent. of nitrogen.

Experiments at King's College on various pot plants soon demonstrated that bacterised peat, in addition to being an excellent medium for the growth and distribution of nitrogen-fixing bacteria, possessed special manurial properties of its own. In order to obtain a strictly impartial and extended test of the bacterised peat, the authorities at Kew Gardens were approached last Spring, and they very kindly arranged to make a series of experiments with a wide variety of plants. The plants selected were hippeastrum, begonia,

streptosolon, asparagus, salvia, alternanthera, primula, carnation, pelargonium, fuchsia, and abutilon.

Twelve plants of each kind were selected by the curator, Mr. Watson, as being similar in size, age, and health. They were then potted up in series of threes in the following mixtures :—

Series.		Part bacterised peat.		Part loam.		Part sand.
1	... ...	1	+	2	+	½
2	... ...	1	+	4	+	1
3	... ...	1	+	8	+	2
4	Loam, leaf mould, and sand (ordinary potting compost).					

The plants were potted up on April 20th, and within ten days the effect of the peat was evident in increased growth and stronger development of the treated plants. This increase was maintained throughout the extent of the experiment, and in six weeks' time the treated plants were double to three times the size of the untreated ones. One very important fact demonstrated by the Kew experiments was that flower production, and especially root development, are promoted equally with increase of foliage.

Equally striking results were obtained on some experimental plots at Eton School Gardens by Mr. Machin, where the manurial effect of bacterised peat was compared with artificials and farmyard manure.

The beneficial effects of bacterised peat as a top-dressing for grass has been noticed by several experimenters. The remarkable results obtained on the Mid-Surrey Golf Course are described as follows by the editor of the *Garden*, writing in *Country Life* on November 1st, after inspecting the greens in the company of Mr. Lees, the groundsman at Mid-Surrey : " The first to be dressed was a practice green, which, owing to the very hard wear to which it is subjected, and the fact that it is on sand, always gives a great deal of trouble, particularly in the autumn. This green was treated on August 28th, and at that time was in a very worn condition. Now (November 1st) it is as perfect as a green could be, the turf being very close and hard and of a particularly healthy colour. Near to this practice green, and also on sand, is an undulating green that Lees assured me has always been a worry to him at this season. This, when dressed with the prepared peat a little more than a fortnight ago, was very brown in places, but now the brown patches have almost disappeared, and the turf is very healthy and of excellent substance. A third green, also of an undulating character, was treated on Tuesday of last week, and three days later was showing signs of improvement. After experimenting with different quan-

tities to ascertain the proper amount to use—2 ozs., 4 ozs., 6 ozs., 10 ozs., and 12 ozs. per square yard respectively—Lees has come to the conclusion that 3 ozs. per square yard produces the most satisfactory results. This is applied in a pulverised state as a top-dressing, and for the first few days seems to open up the soil and to let the grass through, after which this slight sponginess disappears. Not only have these dressings had a most remarkable effect on the blades of the grasses, but root-growth has also been increased to a very considerable extent."

The question has been raised as to whether the results obtained are due to nitrogen-fixation directly or to a more general manurial effect. Probably both are important.

Recent experiments, however, indicate the probability of the presence of another factor. Mr. Watson, in the Kew experiments, noticed that a small amount of bacterised peat often gave as good results as a heavy dressing. This was most evident when the soil treated contained plenty of available plant food. In an experiment with Richardias, potted up in heavily manured soil, he found that a top-dressing of about half-an-ounce of peat to a 10-in. pot doubled the weight of the treated plants in a month's time. Dr. Rosenheim of King's College, obtained equally striking results on *Primula malacoides* by treating twice only with the water extract of 0·18 of a gramme (1-150th of an ounce) of bacterised peat.

Such effects cannot be due to the small amount of direct food material present in the peat or its extract added to the soil, and it was realised that in the prepared peat there is something which has the effect of stimulating and promoting growth in an extraordinary manner. Numerous experiments now in progress indicate that this "something" is probably similar in nature, as Dr. Rosenheim suggested, to the accessory food bodies recently found to play such an important part in animal growth and nutrition. If this is confirmed it will go far towards explaining the specific action of bacterised peat as a fertiliser.—Extracts from a Lecture by Prof. W. B. Bottomley reported in the *Journal of the Society of Arts.*

Housing and Winter Egg Production.—The question of the proper housing of laying stock is a much more important factor in regard to egg production than many poultry keepers realise. Every precaution should be taken to ensure the absolute comfort and health of the birds, for, however well bred and however carefully selected for laying purposes, if they are not suitably housed the results obtained will be anything but satisfactory. Probably the most important item of all is adequate ventilation. Next in importance would come freedom from damp.

A properly ventilated house when the birds have been roosting in it all night should be fresh and sweet when one goes to let the birds out first thing in the morning. On opening the door, one should not be met by that warm, fetid atmosphere which is always found in a badly ventilated house or where the birds are over-crowded. Overcrowding, even in a well ventilated house, is, of course, detrimental to the health of the birds.

Probably the most suitable kind of house for laying stock is the open-fronted type. This house is so constructed that it is closed in on three sides, the remaining side being open, so that absolutely open-air conditions are obtained without draughts, which latter is the all-important factor. The open portion should be the front of the house, and at the highest part of it. This front should be boarded up one-third of the way from the ground level, the remainder being wire-netted, and fitted with two adjustable transparent cloth screens, hinged at the top, so that they will prevent rain beating in but will not obstruct light. In very rough weather the bottom one can be closed right up, but the top one should never be quite closed, as it would interfere with the ventilation.

The roosting accommodation should be at the back of the house, as far from the front as possible and at the lowest point. A house deep from back to front is preferable to a shallow one. The perches, which should not be fixed, should be placed so as to give as much head room as possible, for in winter there is a danger of the cold striking down on the backs of the birds.

Underneath the perches there should be a dropping-board, so that the whole of the floor space may be available for scratching and feeding. This board should be placed as low as possible, without interfering with the amount of floor space. The nest-boxes should be accessible from outside.

When the birds are at roost, large quantities of warm, damp air are given off, and should be removed, so as to prevent this foul air being breathed again. This warm air, being lighter than cold, naturally rises, and, following the upward slope of the roof, passes out at the top of the front of the house; more fresh air enters at the lower portion of the front to take its place, so that in this way there is a continual slow circulation of fresh air, without any draught whatever. The outlet for the birds should be in the front of the house, as elsewhere it would be a source of draught.

As a further preventive of draught, all the boarding used should be tongued and grooved, so that there will be no danger of draughts through cracks at the joints. For this purpose, narrow boards are better than wider ones, as they do not open at the joints so readily,

The roof should be made perfectly watertight, first by selecting wood free from knots and cracks, and secondly by covering with some waterproofing material. For this purpose, one of the many prepared roofing felts may be used, but the great objection to these is that they quickly tear if not securely fixed. The best method of fixing is to lay first the felt in position, and then nail over the top narrow strips of wood about two feet apart, letting the strips run in the same direction as the grooves in the boarding, so that they will not prevent the water running off freely. Another method is to put on hot tar and sprinkle with sand. Or a better method still is to make a mixture in the following proportions, viz.: one gallon of gas tar, 2lb of pitch, and 4lb of lime; put this on hot, and it will make a thoroughly watertight roof.

All the boarding should be treated inside and out with some wood preservative such as creosote, or one of its many preparations, as not only will this considerably lengthen the life of the wood, but, in addition, it is a splendid insecticide.

Where such houses are placed permanently in breeding pens, the best and cheapest form of floor is made as follows:—The house is placed upon a base consisting of a single row of bricks arranged end to end all round the edge of the house, so that it rests on them. This, by keeping the wood from direct contact with the soil prevents it rotting. The centre, is filled in with soil rammed hard, up to the level of the top of the bricks. This should be soaked with disinfectant, and will then give a good sanitary and solid floor, and, what is most important of all, being raised, it will keep dry. A dry floor is of the greatest importance, since during the winter months it is an advantage to be able to cover the whole of the floor with dry litter, in which the birds can be given their grain food, and so be kept well exercised, dry and warm, which three things go a long way towards helping to fill the egg-basket.

This type of house could be used for moving from field to field if required, in which case a wooden floor would be desirable. In all cases the house requires fixing by means of two hooks and staples, attached to two stakes driven firmly in the ground.

Such houses are simple of construction, inexpensive, and the most suitable for laying stock. They may be made in almost any size to suit the requirements of the poultry-keeper.—"F. W. R." in *Farmer and Stockbreeder Year Book.*

Future of Horse Breeding.—It is to be hoped that the European War has at last brought home to the public what every thinking person must have known for years, that the size of our army is totally inadequate for what is required of it, and that the number of

light horses needful for that army is rapidly diminishing. The use of motor cars by private persons and also for trade purposes has increased to such an extent that the farmer can no longer afford to breed light horses for the limited and underpaid market which alone is open to him. Horses are now needed for :—1, Racing; 2, Farm work; 3 Cavalry; 4, Hunting; and the few, very few, needed for harness work can be supplied from the misfits of 3 and 4.

Owing to the initial expenses race-horses are mostly bred by wealthy owners; moreover they begin work, and possibly gain their living, at two years old, and the enormous prizes open to them and amount of enjoyment they afford to a large class of people will always induce many people to breed them. Farm horses can start work at two years old; they require less care and attention than any other horse, and invariably fetch a reasonable price even at public auctions. It pays farmers to breed them, especially those farmers who are fortunate enough to live in a neighbourhood where the best stallions are at their service at a reasonable rate, and where the foals are often bought at prices far beyond the expectations of their fortunate owners. Even if it be desirable to keep a gelding destined for town work till five or six years old, when the jar of hard roads will less affect his joints, he can still be used from two years old on soft ground, greatly to his benefit and that of the farmer. The best proof that breeding of Shire horses is the small farmer's trade is that the majority of prizes won at the Shire Shows are by animals bred by tenant farmers which have been bought as foals by big landowners.

Cavalry horses are not fit for hard work before the age of five or six, but a farmer cannot possibly afford to keep them for that time if he will only get £40 for the best when they reach that age. The whole question is a money matter. If the Government would give £40, or £50, or £60 for a two-year-old horse, many farmers would breed them. Stallions at disposal of farmers should be absolutely sound, the fee should not exceed £2, and they should be easily reached; that means that there should be a very great many of them scattered all over the country. At the present time, even if a fee be low, there is oftentimes great difficulty and great expense in sending the mares, maybe three or four times. The Government could keep the horses from two years old to four years old in the big parks at Windsor, Richmond, and Bushey instead of the useless deer. The different cavalry regiments should take them up for training at four years old, but they should not do regular hard work before reaching five or six years of age.

As long as the breaking up of estates and the division of land

into small properties does not stop hunting altogether, there will be plenty of money to buy hunters. Farmers will breed them too if they can be sold at two years old, but must demand a high price if they are to be kept longer. It is not the fee for service that stops the farmer; but the expense of keeping the young horses, the amount of care and attention they need, and the skill required to train them.

The French Government has large breeding establishments in Algeria, and I believe the German and Austrian Governments have also large studs. There has been some question of starting a horse-breeding organisation in Canada; the sooner the Government makes up its mind about it, the better for this country. South Africa also would afford splendid breeding grounds. The best horses of all come, undoubtedly, from Ireland; surely it would be easy enough to organise studs there, and also to make it worth while for the farmers to breed on a large scale.—Sir E. D. Stern in *Live Stock Journal Almanac.*

Adaptability to Present Circumstances.—Much is being said in relation to increasing the wheat area of the United Kingdom, and whether it should be at the expense of other cereals, such as barley or oats, or at the cost of worn-out grass land, or on the area which was previously intended for roots and rotation grasses? Probably the area devoted to barley could be diminished without great privation, but when we take into consideration the oats imported into this country for provender and the indispensable value of roots and rotation grasses for the maintenance of stock, some hesitation is needed before embarking on any procedure which might have the same effect on our food supply as a shortage of wheat, because we must realise that a nation cannot live on bread alone in a climate such as our own.

In years gone by farmers have been advised to change their system of farming and turn their arable land to pasture. Now the state of affairs calls for the opposite policy. But, with their past experience, farmers are loth to revert to the plough, especially on the strong unworkable clay soils in many parts of the kingdom which are known to be expensive in horse keep and labour. Viewed from a national standpoint, the changed conditions brought by millions of acres of land having gone from the plough means millions of pounds lost yearly to agricultural labourers. Is it any wonder that the labourer has left the rural districts? Fewer hands are employed and less work is given on the land than in the days of ploughing prosperity.

The future always leads one forward hopefully; if it does not, things are indeed in a bad way, while a bright lining is evident on the margin of the cloud which is the harbinger of a brighter time to come. The saying, "That the present is always with us, the future never comes," is a miserable anticipation. It is certain that existing conditions cannot carry British agriculture far into the future. There must be a change, both in the interest of the farmer and the nation.

The farmer must make his business one by which the nation's food supply can be more safely depended upon, and the obvious duty of the Government is to make conditions such as will permit of national food being grown at a price which will encourage and intensify the production of it.

Without the loss of their general shrewdness, farmers have changed in a remarkable manner, and, with anything like encouragement, they show their willingness to change again, in order to meet the national duty devolving upon them of feeding the nation in a more ample manner. Changes cannot be effected on the farm without considerable outlay of capital, any more than in any other trade. If farmers have the reputation of being slow to make radical changes, it is more often due to the outlay involved than to ignorance and prejudice.

Alterations are frequently not made owing to the terms of existing agreements which were signed in years gone by, in times bearing no relation to the present. And there are landlords who hold notions of land tenure inherited from bygone days; men from whom it is not easy to get a change of lease.

There are thousands of farmers holding leases and agreements containing clauses which in the present times are preventive of the best results; for instance, a tenant may lay down land to permanent pasture, which not only makes better turf, but is more conveniently situated to the homestead, yet he is refused permission to plough up some worn out old turf adjoining the homestead, which could be worked at a minimum cost and rendered more valuable to tenant and nation if under cultivation. Without a doubt, many thousands of acres now in poor turf might be producing food for the nation and at the same time bringing more profit to both tenant and owner. The landlord should, of course, be protected against the unscrupulous tenant who endeavours to use up any available fertility and then changes his farm. But if the good tenant were allowed to make the changes that his experience with the land warranted, and was not pegged down by hard and fast leases possessing no elasticity, he might be able to meet the altered condi-

tions of the times, and this would be better for both the landlord and the tenant.

The want of knowledge of the principles of agriculture which still exists in some estate offices is apparent for they provide one form of lease to meet the varying capabilities of the wide range of soils we have in our country.

The effect of this error may be seen to-day on many holdings. Those responsible in the past did not see the necessity of having suitable tillage land near the homestead to save labour in cartage and men's time, and it did not occur to them that stock was more easily moved to the outskirts of the farm than manure, roots and corn. In many instances, the land put down to permanent pasture around the homestead, was probably the best tillage-land on the farm. The future of farming will require more care in these directions.

Temporary pastures possess a remarkable property, namely, that both the grasses and clovers of which they are composed can be used to add fertility to the land. Years ago, it was a rule to regard grass seeds as being somewhat exhausting to the land unless they were fed on. They can, however, be made to add greatly to its permanent fertility. By the use of deep-rooting grasses, which draw upon the lower sections of the soil for their support, combined with the clover plant, which is now recognised as being able to accumulate atmospheric nitrogen, temporary pasture may add much to the farm in the way of fertility.—A. G. Leighton in *Mark Lane Express.*

Our Herdsmen.—It would be quite impossible to attempt to estimate the deep obligation the owners of herds of cattle in the different parts of the world have been under to the men in charge of their animals.

Every owner of cattle will readily acknowledge that much of the success of his work depends upon the honest and intelligent discharge of duties which must necessarily be left to his herdsmen.

A long experience gained under favourable circumstances through coming in direct contact with men in charge of pure-bred stock, enables me to speak more particularly of them, and of the important traits in the character of every successful herdsman. To the faculty of keen observation is added a love of animals, a sacrifice of self on many occasions, and a spirit of emulation.

This faculty of keen observation possessed by our herdsmen is brought to bear upon the temperament, the comfort, the health, and the progress of the animals under their charge.

Every animal has an individuality belonging to itself, and the appreciation of this fact, more especially in the case of bulls, is most essential on the part of the attendant of stock.

Many years ago, when viewing a herd of cows in a field, I drew the attention of the cattleman to one of the cows, she being a very good specimen. He said, "She is a grand cow; but she has her peculiar ways, and it is no use *arguing with her.*" The expression he used led me to encourage him to discourse, and this brought out a great amount of information regarding the dispositions of the different animals under his care, their likes and dislikes, and their selection of companions, together with interesting and valuable particulars connected with maternity, and other important matters. The conversation revealed the careful study which the man had given to the character and disposition of every one of the animals under his care.

The behaviour of a collection of large bulls in the comparatively small space of a judging ring, is a clear indication that their temperaments and individualities must have been carefully studied by their attendants. During their education we can quite understand that there has been no foolish demonstrations of affection likely to encourage undue liberties on the part of a youngster of high courage, yet that there has been an entire absence of rough or cruel treatment, with the result that complete confidence has been established on both sides. Herdsmen fully realise the fact that no bull can be trained to be approached with confidence by any system from which kindness has been absent, or in which the moods and dispositions of the animals during moments of excitement have not been carefully considered and noted. Instances can be given of bulls who, up to a certain period of their lives, men could attend to easily, and yet they afterwards became vicious and dangerous. Could we get at the facts connected with such cases, it would no doubt be found that through a momentary loss of temper on the part of the attendant, or the lapse of the usual gift of observation regarding excitement in the animals, the relationship previously existing between them came to be completely changed.

The faculty of observation possessed by herdsmen plays a most important part in connection with the health of our herds. The most trifling signs of indisposition at once arouse attention, and efforts are made to ascertain the cause. The benefits of "first aid" are frequently demonstrated in cattle stalls and boxes.

Animals being prepared for showyards live quite an artificial life. Every effort is made to encourage their development, they are fed upon concentrated foods taxing their powers of assimilation and

their organs of digestion, yet, thanks to keen observation and first aid, either in the cessation of all food for a time, or a change of its components, or some other of the many devices known to herdsmen, all is kept normal, and showyard honours go to the credit of the owners.

The faculty of observation applied by our herdsmen during calving seasons, together with the kind attention bestowed upon parents and their offspring, also deserve full recognition. Sleepless nights, anxiety, and endless troubles give place to pride in the youngsters, whose lives in many cases had depended upon the patient and unremitting care bestowed upon them. Cases of serious illness, though rendered less frequent in herds where capable men are in charge, will sometimes occur, and veterinary surgeons freely acknowledge being greatly assisted by capable herdsmen at such times. The lives of many valuable animals have been saved through the herdsman's attention to the carrying out of every detail in the instructions given by the professional adviser.

I have only touched the fringe of an important subject. The ability and genuine worth of the majority of herdsmen I have come in contact with during an extended term of years, appeal to me most strongly.

In their whole-hearted service to their employers, their love of animals and their keenness of observation, they are doing their part to maintain the world-wide reputation of our herds of pure-bred cattle.—ROBERT BRUCE in *Live Stock Journal Almanac.*

Poultry on the Farm.—Lecturing upon this subject at the Glasgow Agricultural Discussion Society, Miss Barr, of Whiteshaw, Carluke, said :—I am to speak on one of the means of increasing the produce from our farms, and it has lately been brought very strongly before us how desirable it is to produce every ounce of food that we can. The person who is successful in producing good sound food for the nation has no need to look for any higher calling. At this time in particular there is great need for every farmer to produce all that he can and to waste nothing, and poultry might be made more productive, and be more economically handled. In the case of poultry it is possible to rapidly increase the yield. Chickens hatched in March should, if well brought forward, lay the following October or November, and by next autumn we are likely to be feeling more than we do now the lack of our usual foreign supplies. I am speaking on poultry on the farm as distinct from poultry farming. I question very much if poultry farming pure and simple will ever be a success in this country. So far, at any rate, it has not been very successful

and to make a living at it entails a lot of extremely hard work. If we look at the chief egg-producing countries we shall find that the eggs are not produced on poultry farms, but by poultry on the farms. British eggs suffer very much from not being attractively marketed. They are ungraded, often dirty, and sometimes stale.

In the past, the poultry on the farm have been perhaps more neglected and more ignorantly dealt with than any of our live stock. Hens are still housed in most unsuitable places. It is difficult to convince people that hens will not do with over-crowding, and, indeed, many people do not know what over-crowding means. As a general rule, ready-made hen houses hold just half the number of hens comfortably that they are advertised to do, and it is always better to keep few rather than many in a house. The feeding, too, is often both unsuitable and wasteful. My grandfather used to say that every egg produced on the farm cost him sixpence, and, taking into consideration the small number of eggs produced per hen and the extravagant method of feeding which was in vogue, probably his estimate was pretty correct. It is an extraordinary thing that Scotch people, usually so prudent and careful, should be so extravagant and wasteful in the feeding of hens. One of the principal reasons for this waste of food is that no separate account is kept of what the hens eat. Their food is slumped in along with the food for the rest of the stock on the farm, and not one farmer in fifty can tell you what the hens consume. Another cause that encourages waste in feeding is the fact that the person who claims the money for the eggs does not pay for the food. By ancient usage the farmer's wife gets the egg money for her pocket, but she does not pay for the food, and so is less careful of it. Hens, like all else, should be kept on a proper business footing, and some account kept of what they eat and what they produce. On an ordinary farm it is difficult—almost impossible—to keep separate supplies of food for the hens, but without this it is quite possible to estimate pretty accurately what it costs to feed them. Count the hens, then weigh out the feeding in proportion, and from this you can work up what the feeding costs you for a year. It you have no idea of what a proper ration for a hen is, consult the bulletin written by Miss Kinross, and issued by the West of Scotland Agricultural College.

The old system of keeping hens in the farmyard is being ousted by the colony system of keeping hens in the fields. There are advantages and disadvantages in both systems. Hens kept in the yard are more conveniently fed and safer from thieves, and pick up many a grain of corn that would otherwise be lost. On the other hand, they make the yard dirty; work a lot of destruction to

turnips, cabbages, and other food put down for cows, and are constantly getting into the barn and meal house. Hens kept out on the pastures require less food, and have the advantage of clean grass, and, generally speaking, do much better. The disadvantages are the danger of thieves and the increased labour in feeding. In the matter of hen stealing the authorities might do something, because so serious is this danger in certain districts that it altogether precludes the keeping of hens on the pastures. The labour question is on most farms a serious one, and will probably become more serious as time goes on. Now, the labour of carrying round food two or three times a day to poultry out in the fields is considerable, and, on a dairy farm where there is a lot to do in the morning, is sometimes difficult to undertake. Nevertheless, if at all possible, we would recommend the colony system, as the hens are healthier and the egg production larger in proportion to the food consumed, and if kept in proper numbers the grass, except a small part round the house, does not suffer for the use of other stock. There is a third method of poultry keeping which has lately been very much brought to the front by the Board of Agriculture. At the beginning of the war the Board issued a leaflet urging all and sundry to go in for intensive poultry keeping. Now, why anyone should go in for the intensive system, save of absolute necessity, I cannot see. In spite of the Board's assurance to the contrary, an intensive house costs a good deal to put up, and the labour of feeding and keeping clean is easily double, while the food bill is also higher. There was also a suggestion from another quarter to hatch chickens in August and September for spring use. This was also an entirely unsuitable scheme for farmers. Fortunately, the poultry keepers of Scotland have not gone in largely for this scheme. It is possible to rear chickens hatched in August, but a special brooder house, warm, dry, and well lighted, is required, and the utmost care and attention are requisite to bring them through the short, dark days successfully. Even with the greatest care there is certain to be a large proportion of losses. No ordinary farm has premises in anyway suited to the winter rearing of chickens.

I now propose to describe to you the Whiteshaw system. Three pure breeds are kept—White Wyandottes, Rhode Island Reds, and White Leghorns. I have found all do very well, but as all run together I cannot give you any figure about the egg yield of the separate breeds. I have lately thought of giving up the White Wyandottes, as I think the Rhode Island Reds are hardier and more suitable to our cold clay soil and high altitude. I consider the Rhode Island Reds a most excellent all-round breed. They do not

get fat so readily as the White Wyandottes, and I have not found them so subject to broodiness. If you have a good strain they are also very handsome. Indeed, I do not know a finer sight than a flock of Rhode Island Red pullets in the month of September. There are, of course, many other breeds which might with advantage be kept in a milder and more sheltered locality. Faverolles stand high for egg yield, but owing to their feathery legs are not suited to a damp soil. We have now done away with housing in the farmyard, and the hens have their abode in six colony houses. We have 120 hens, so that works out at 20 hens per house. Three of the houses are in a small field in front of the house, and three in the stackyard. They are placed rather nearer together than I would like, but we are obliged to keep them near the house, both because of the danger of hen thieves and because of the labour question. Four of these houses are modern, and have the roosting part at the back and a part for scratching in front. The advantage of these modern houses is great. They are so much more comfortable for the fowls, and so much more easily kept clean. Granulated peat moss litter is by far the best thing to use in the roosting part. It is more economical if mixed with some chaff. For the scratching part I like the short straw that falls through the rack in threshing. I may say that I have repeatedly kept hens shut up in very stormy weather, and they have continued to lay well all the time. It is advisable to wash the perches occasionally, and we clean the houses out at least once a month. Great care should be taken to keep the nests clean, as the fine flavour of the egg is spoiled if it lies in a dirty nest. Houses should be whitewashed out at least twice a year, but four times is better.

We feed twice a day in summer and three times in winter—a warm mash in the morning, and grain in the afternoon, and in winter they get a small feed at mid-day of Indian corn and oats boiled together. The following is the ration used in winter, and we use the same in summer, but omit the noon feed. The cost of this ration works out at 1¾d. to 2d. per bird per week. This is the quantity for fifty fowls:—Morning 3lb.—Bran, ½lb.; thirds, ½lb.; meat, ½lb.; oatmeal 1½lb. Noon, 3lb.—Indian corn, 1½lb.; oats, 1½lb. Evening, 5lb.—Wheat, 2lb.; oats, 3lb. In addition to this, during November, December, January, and February the fowls get turnips as green food. We have thick pieces of wood and two nails driven through and projecting on the other side. On these the halved turnips are stuck, and the fowls devour them greedily. This is, perhaps, the easiest way in which the farmer can give an extra vegetable to the poultry. Fresh water must be supplied—in cold,

frosty weather it is good to give it hot. Grit is also an absolute necessity for hens. Soft food and boiled corn should be fed in troughs, and the grain scattered amongst litter. This ration is sometimes varied a little; for instance, when there is a sufficient quantity of household scraps to take the place of it, the biscuit meal is omitted; or if a stack is being taken in, and the stackyard fowls are getting a bit of extra picking, less corn is given them. During the winter months, lights are used as meat. These we get once a week from a butcher in a neighbouring town. In summer fish meal is used, as in the hot weather the lights do not keep. If fed in this way, it will be found that fowls will lay well even in the most severe weather, and will amply repay the trouble taken. It is, however, chiefly on pullets that we have to rely for winter eggs, and in my experience they require to be hatched not later than the middle of March to lay in October and the beginning of November. If you intend to breed pure-bred poultry on the farm you must have runs to shut them up in. We have three in the garden, and, so far as the poultry are concerned, they are the most useful things that we possess. In spring the fowls are shut up in them for breeding purposes, and as soon as we get sufficient eggs for our requirements they are let out. We have another small run which is used for a chicken nursery, and the chickens, when about one month old, are drafted into the garden runs from there. I am aware that this is not considered a good practice, but the runs are rested about a month between the time the hens go off and the chickens go on, and we have never had any trouble. From there the pullets are taken out to a field near the house, while the cocks are left in the runs and fattened for the table. I find the cockerels do very well, and at sixteen weeks old I this year got 2s. 8d. each for them at the auction mart at Lanark. These cockerels were fed on a ration of the following proportions:—1lb. Indian meal, 1lb. oatmeal, ¼lb. fish meal mixed with skim milk. The usefulness of the runs is not yet exhausted as the old hens are drafted into them in autumn while waiting for a suitable opportunity to sell them. One year we were obliged to remove our chickens about half a mile from the house owing to the presence of a weasel. The grass on which they were put was perfectly fresh. Owing to the distance we only fed them three times a day at first, although they were quite young; later we fed only twice a day. Nevertheless, they throve marvellously, showing the benefit of putting chickens on perfectly fresh ground. I often think that chicken coops are far too close, and that it would be an advantage to adopt the open frontal system in them also. Last year I had a brood of late hatched Rhode Island Reds,

and as I had a lot of chickens I was not so particular about them as the earlier ones, and left the coop open at night. Of course, this means great danger from vermin, but these escaped and did so well that in the course of five months they were hardly distinguishable from those two months older. The longer you work with poultry the more impressed you are with the value of unlimited fresh air.

We hatch both naturally and artificially. The incubator is a great help, as you get a lot out at once, and fifty are as easily looked after as twelve. We like to have the first hatch with the incubator about 15th March. Earlier than this is not suitable in our district owing to weather conditions, but if you hatch about 15th March and keep them inside for a fortnight, the weather is improving by the time you let them out. The hens also do very well, and if properly set and handled, there should not be many broken eggs. It is absolutely necessary to dust hens with insect powder before setting them, otherwise disaster will result. The sitting hens should have only grain to eat, and should be supplied with grit and water.

We feed young chickens at first every two hours, and, later, four times a day and then three times a day. They get alternately soft food and seeds. For the soft food we use Spratt's best biscuit meal and oatmeal in equal parts, and a little meat. They must have grit and green food. Grass cut up with scissors does very well. The following is the seed mixture we use :—First to sixth week—35lb. cracked wheat, 21lb. cracked maize, 21lb. pinhead oatmeal, 14lb. broken rice, 14lb. canary seed, 7lb. hemp seed. Sixth to twelfth week—28lb. cracked maize, 56lb. cracked wheat, 7lb. hemp, 21lb. Dari. Twelve weeks onward—equal parts of wheat, maize, and oats. To keep up a stock of 100 laying hens it is necessary to have about 50 pullets annually, thus renewing half the stock every year. Hens over two years old do not lay a sufficient number of eggs to be profitable. If in good condition, these old hens often sell well.

Eggs in this district make a good price, and the price is likely to be higher for some time to come. If a private trade is to be worked up, it is absolutely necessary to have eggs clean, all of a fair size, and to be sure that there are no stale or rotten ones amongst them. These bad eggs sometimes get in owing to the practice that farmers have of not gathering eggs daily, and of including the eggs found in a stolen nest amongst those sent to market. Eggs which a hen has laid away should always be kept and used at home.

Poultry keeping is essentially a woman's occupation, and it is to women we must look to extend the poultry industry on the farms. Much of the work on the farm in this country is not suited for

women, but this cannot be said of poultry keeping, and I earnestly hope that in the near future we shall see a very great increase in the poultry kept on the farms, and it is to the farmer's wives and daughters that we have to look for this. Instruction in poultry keeping is now easily obtained, and the work of the instructresses has been admirable. All women are at this time anxious to put forth every effort to help the nation. For us women on the farms a duty to the State lies at our hand. The dairy and the poultry yard are our province. Large supplies of milk and eggs are required, and it falls to us to see that they are produced.—*The Scottish Farmer.*

The Farmer's Library.

NOTES AND REVIEWS OF NEW BOOKS.

1.—*An Agricultural Faggot.* By R. H. Rew. Westminster: P. S. King & Son. 5s.

The author of this book is one of the best known agricultural statisticians of the day, who has for many years past contributed articles on agricultural topics to the Journals of the leading Agricultural Societies. Now these articles are collected and re-issued in this volume. To the outsider, the title gives little indication of the nature of the contents, for a faggot is composed essentially of dry and mostly dead material, and these essays certainly cannot properly be so described. We read many of them when first they appeared, and have heard some of them read as papers at the Farmers' Club or elsewhere. And now upon re-reading we find they possess the same interest, are still endued with vitality, and are still able to make us pause to think. As we all know, facts are stubborn things. They may be put before us either in a repellent, or an attractive manner. They may be twisted by bias, in order to support a conclusion or an argument not based upon them, or they may be conscientiously studied and the conclusions shown to which they imperatively lead. In this way only, are they the foundations of truth, which most of us seek, and all need to arrive at, especially at the present moment, with regard to agricultural questions. Hence the book appears most opportunely.

One of the most interesting thoughts it raised in our mind when reading it was one which possibly the author little dreamed of. Some words in his Introduction seem to suggest an answer to the question which has often been asked, viz.:— Why do the best soldiers come from the land? The following extract appears to give some incling as to the answer.

> "So through the fluctuations of the years, prosperity and adversity come to the farmers, some succeed and others fail, but from one generation to another, seed time and harvest, summer and winter, continue, and the cultivation of the soil

> goes on. The land remains, and those who till it, though outwardly different, are kindred in spirit with their forefathers. Endurance is the badge of all their tribe."

Such is the quality, one of the most valuable of all qualities in men, which is characteristic of the tillers of the soil, and what is it that makes the soil of England to-day capable of raising the finest crops, and the best live stock that the world knows? Surely there must be some explanation of this, and, if so, we should all know it and fully appreciate it. We think the author gets very near to this explanation in the following extract:—

> "It is well that the community should have a sympathetic regard for those who till the soil, and that the State should 'anxiously consider the welfare of agriculturists.' But beyond the interests of individuals, above even the interests of the present generation, is the interest of the Land itself. There is much in the history of agriculture in this country which may be criticised; its progress has not been achieved without hardship and oftentimes injustice to individuals, but, whatever may have been the defects in our land system, it has on the whole been successful in making and maintaining the fertility of the land."

In all, there are ten papers reproduced in this volume. The first, "Farming in Olden Times" is mainly historical, and the same is partly true of the second and third articles which deal with "Agriculture from 1846–1896," and with "Markets and Fairs." But the other papers, in the main, deal with subjects of perennial interest, such as the "Middleman in Agriculture," "Combination among Farmers," and "Co-operation for Sale of Farm Produce." There is also a short article on the "Nation's Food Supply," showing how, by means of home produce and imported articles, the 386 million pounds worth of food which the United Kingdom consumes annually is made up.

We think we have said enough to justify our opening remarks as to the title of the work, for, although the articles composing it may be bundles of facts, the charm of their arrangement and treatment generally has not only deprived them of all dryness, but has endowed them with a fresh vitality; they are living twigs from the tree of knowledge.

2.—*Forage Plants and their Culture.* By C. V. Piper. London: Macmillan & Co. 7s. 6d.

This is an American book, one of the Rural Text Book Series, other works in which series were noticed in last year's "Journal." In England, works on Agriculture and Agricultural subjects are, as a rule, of a general character. There does not appear to be in this country a reading public interested or engaged in agriculture sufficiently large to justify the publication of special works on small branches of agricultural practice. Yet many such books are published on the Continent, and some are now beginning to appear in America. The exceedingly diversified conditions existing in North America have led to the cultivation of an unusually large number of plant species for forage production. Some of these are successful or important over but a comparatively small area, while not one is capable of profitable cultivation over the whole region. The climatic conditions of some parts of North America, especially the dry regions and the Southernmost States, are not closely duplicated in any part of Europe. This fact has necessitated the introduction of numerous grasses and legumes from other regions in order to secure forage plants capable of profitable cultivation. The success of these endeavours has resulted in the utilization of many forage crops practically unknown in Europe, such as numerous varieties of sorghum, cow-peas, soy-beans, Japan clover, Florida beggarweed, velvet bean, Bermuda-grass, Rhodes-grass, and many others.

The aim of the author has been to present as concisely as practicable the present state of our knowledge with reference to each forage crop grown in America.

In spite of the fact that many of these crops are not grown in England, we must not forget, as the author points out, that:—

> "To rear animals necessitates forage; and the more important the animal production, the greater is the necessity that the forage be grown as a crop, and be made a part of the farm scheme. The forage crops are now of many kinds, and they are taking their places in the regular farm management plans of the forward farmer. These crops also have their own value as marketable products, constituting one of the important cash incomes of the farm."

While fully realising that the English language leaves much to be desired, in not lending itself to development so rapidly as develop-

ment is taking place in various industries and calling for new nomenclature, still we do not think that American attempts to fill the gaps have been happy. This thought was prompted by the following sentence from the author's introduction :—

> "*Feeds* are conveniently distinguished according to nutritive value into *concentrates* with high feeding value and *roughage*, or *roughness*, with relatively low feeding value." "Roughage includes hay, fodder, straw, silage, roots, pasturage."

The author draws attention to the fact, which most of us must have noticed, that there is less accurate knowledge of forage crops than of other crops, such as cereals, and he considers the reasons for this are as follows :—

> "*First*, forage crops are only rarely grown as money crops, and the farmer seldom knows with any degree of accuracy what yield he obtains. His forage crops are, therefore, not brought into yearly comparison with those of his neighbours, so that no definite criterion becomes established as to what are good and what poor yields. Consequently, there is lacking the spur for better effort brought about by the knowledge of the yields, and, especially, of the money returns secured by neighbouring farmers.
>
> "*Second*, there is a larger variety of plants grown for forage, no one of which is cultivated over so wide an area as any of the important cereal crops. There is consequently a smaller amount of information about each of the many forage crops than there is concerning any one of the few cereal crops.
>
> "The purely agronomic knowledge available—that is that relating to yield as affected by environmental, cultural, or other factors, namely, climate, soil, fertilizers, culture, irrigation, variety, rate of seeding, rotation—is partly the result of definite experiments, but largely the experience of farmers. Experimental results, where available, are more enlightening than those based on farm returns, but a vastly greater amount of experimental data is necessary for a better understanding of the complex factors which affect yield. To the critical student, the relative paucity of accurate knowledge concerning yield relations will be apparent as the data concerning each crop is studied."

We cannot help thinking this is equally true of the forage crops grown in England. There is a lack of accurate data.

In treating of the Botany of forage crops the author points out

that the greater numbers of forage crops are either grasses or legumes. He explains the reasons for this, one of the chief being, "that the growing part of a grass leaf is near its base and so is not injured when the upper part is bitten off, while with most other plants the growing point is terminal, and therefore easily destroyed by grazing animals." But there are grasses and grasses. All are not valuable, and the author describes those which are as possessing the following characteristics :—

> "Among the characteristics a grass must have to be valuable under cultivation are *satisfactory yielding capacity* for the purpose employed, whether pasture, soiling, silage or hay; *good feeding quality*, that is palatable, not too woody, and without any injurious physiological effects; *good reproductive characters*, such as abundant, easily gathered seed, or ready multiplication by vegetative methods; and aggressiveness."

Had the book been a translation from the German one might have understood this term. But it appears to be another newly introduced word, and subsequently we found the following explanation :—

> "Aggressiveness, or ability to hold the soil against weeds and other competitors, is an exceedingly important character in all perennial meadow or pasture crops. Plants of Old World origin are in this respect far superior to those of American origin, at least for cultivation in the New World. With but a single exception, every perennial hay plant cultivated in America is of Old World origin, and among perennial pasture plants there are but few exceptions. Many of the native American grasses are equal to Old World grasses in yield and nutritiousness, but with perhaps a few exceptions they lack in ability to retain possession of cultivated land against the competition of weeds. The reasons for this are not apparent, but the fact scarcely admits of doubt."

The few extracts we have quoted are sufficient to give a clear idea of the new views which the author puts before his readers, and of the interesting way in which subjects are dealt with.

In considering the preservation of forage, we are reminded that the making of hay is dependent almost wholly on favourable weather conditions, but that "one method of preservation—silage—is perfected to a degree which makes it comparable with a factory process." Both methods are considered. Grasses, clovers and

legumes are all studied in order, including some which are uncultivated in England. Whether any of them might be cultivated with advantage must be left to readers to decide. So far as we are aware, there is no other work in the English language which deals with forage crops and their cultivation so exhaustively as this, and we welcome it as a valuable adjunct to the Farmer's Library.

3.—*Agriculture, Theoretical and Practical.* By J. WRIGHTSON and J. C. NEWSHAM. London: Crosby, Lockwood & Son. 6s.

In the writing of Text Books or Manuals for educational purposes Englishmen have yet much to learn from continental teachers. Perhaps that is why so many continental educational works are translated. The two chief faults of English books are, on the one hand want of scope, and on the other too detailed a study of the subject matter treated. Think of what the term agriculture in its widest sense means, and who can mention a single English book intended for a text book which attempts to cover the ground. Yet in France there are books written for elementary schools which do so, while in Germany there are many remarkable examples of exhaustive manuals.

These remarks have been prompted by the fact that this book probably covers more ground than any other text-book of agriculture extant. The authors divide their subject into six parts, and consider in I. Soils, Manures and Crops, in II. Live Stock, Feeding, and Economic Zoology, in III. Buildings, Machinery, Implements, and Accounts, in IV. Dairying, in V. Horticulture, and in VI. Poultry, Rabbits, and Bees. We can imagine the average agriculturist asking: how can two men know all about these subjects? That is a typical criticism, and those two words "all about" show the ordinary assumption that only an expert has the right to attempt to teach others. It is quite a mistake. The first art of the teacher is to select the essential broad principles which may be taught, and next the best specific examples to employ for this purpose. Probably there never have been two men associated in the preparation of an educational work who were better qualified than the authors for such a task. The one is a veteran in agricultural practice and agricultural teaching, the other a comparatively young man, trained in and teaching all the most recent methods of agricultural practice and science. If such men could not write a text book which

would be suitable alike for agricultural students and those farmers who are willing to add to their knowledge and benefit by the experience of others, who could ?

That there is great need of sound instruction all must agree. As Lord Northbrook, who has written an Introduction to the book, says :—

> "We are just at the beginning of a great movement in agricultural matters. Small-holdings may be expected to increase in number in suitable districts, and Farm Institutes, under the encouragement of the Board of Agriculture, and financial support from the Development Fund, will no doubt spread over the country.
>
> "Undoubtedly the coming years must see more and more of an organised system of education, and greater attention paid to the thoughtful treatment of the land if it is to provide a living to those engaged in its cultivation, and this can only be secured by the application of exact knowledge, sound practice and reliable theory."

A very careful study of this work enables us to consider it a masterpiece. It is clearly written, systematically arranged, well illustrated, and up-to-date, and treats the most recent and debatable advances in agricultural practice and theory in an impartial and scientific manner. One feels astounded at the prodigious amount of information it contains and the untiring energy of its authors. The publishers also deserve the thanks of the many students who will utilize the book, both for the very moderate price they have put upon it and the excellent way in which it has been printed and illustrated.

4.—*Cost of Food in the Production of Milk.*

For the past few years the South-Eastern Agricultural College has been investigating what was the cost of the food employed in the production of milk by the dairy farmers of Kent and Surrey. They have issued three Reports on the results of this investigation. The third Report, made by Mr. G. H. Garrard, was issued last year. The following extracts will give some idea of the general scope of the investigation, and a few of the results obtained. Those

who are interested in the details may purchase a copy of the report for 2s. from the Secretary, South-Eastern Agricultural College, Wye, Kent.

The main object of the enquiry has been to obtain information regarding the cost of food in the commercial production of milk. In most Milk Recording Societies established in this country the primary, if not the only, object has been to ascertain the yield and quality of the milk from individual cows, while the cost of feeding has been almost entirely neglected. But although an official "Milk Record Certificate" may be of inestimable value to the owner of a pedigree cow in a large sale where export buyers are present, in the case of a commercial herd of non-pedigree cows there is not the same demand for a certificate which, as the result of "surprise visits" and other means to ensure the figures being genuine, can be certified as "Official." A good dairy farmer realizes the value of his best cows and will not be tempted to sell them for the £20 to £25 which they might be expected to make in the open market. Nor will he be induced to sell the heifer calves of his best cows, and it is only in the case of bull calves that the "Official Milk Record Certificate" is of any real value to him. In other words the Milk Records of his cows will be of more value to himself for his own information in feeding, breeding, and weeding out his unprofitable cows than to other people, and there is not the same necessity for close supervision of his Milk Record figures by an outside official as in the case of Pedigree Herds of fashionable strains. To the commercial dairy farmer, assistance on the part of the Milk Recorder, in weighing the food and working out the cost of food in milk production, with a view to cutting down expenses, is quite as important as the actual weighing of the milk.

The chief objects of the investigation were:—

(*a*) To obtain further information as to the cost of food in the production of milk, and to verify or correct the conclusions drawn from the figures of previous years.

(*b*) To encourage farmers in the keeping of Milk Records with a view to eradicating the unprofitable cows from the herd, rearing calves of the heaviest milkers, and feeding each cow according to her yield of milk.

(*c*) To encourage farmers to weigh the food consumed by their cows, in order to avoid wasteful feeding, and so reduce the cost of milk-production.

(*d*) To determine the percentage of fat in individual or mixed samples of milk.

The testing of the milk of individual cows was carried out in some cases, but it was not specially encouraged. Where milk is used for butter or cheese making, the value of the cow to the farmer depends to an appreciable extent on the quality of the milk, but in the South of England, where milk is produced almost entirely for sale and no higher price is given for milk containing more than the Government standard of fat, 3 per cent., there is no encouragement to produce milk containing a higher percentage.

The visits of the Recorder were continued as nearly as possible at monthly intervals throughout the year. Where his visits coincided with the day of the weekly weighing of the milk, his figures took the place of the ordinary figures. When his visit did not coincide with the usual day of weighing, his figures were used as supplementary to the weekly figures.

The results of these visits are tabulated and fully considered in this report, and we shall only refer to one or two of the Tables.

The first shows the cost of indoor feeding from February 1st, 1913, to April 16th, 1914.

There is a distinct drop in the cost of indoor feeding between the third round (April 3rd to April 29th) and the fourth round (April 30th to June 2nd) from 5·18d. per gallon to 1·14d. per gallon, and a corresponding increase between the ninth round (October 1st to November 4th) and the tenth round (November 5th to December 4th) from 1·87d. per gallon to 4·54d. per gallon. Obviously the sudden drop in the cost of indoor feeding is due to the cows going out to grass, so that the Summer period for the year 1913 may be considered to begin on or about May 1st, and to conclude on or about November 1st. The year is thus divided into two equal periods of twenty-six weeks each, and these two periods coincide fairly closely with the two periods during which farmers receive Summer prices and Winter prices for their milk.

It was found that during the winter one farm produced milk at 4·21d. per gallon for food, whilst on another farm it cost 7·08d. per gallon. There were eighteen herds regularly examined during the winter for the six months, November 1st, 1913, to May 1st, 1914.

The average daily yield of milk was 2·26 gallons, the average cost of food per day, 12·12d., and the cost per gallon of milk 5·36d.

Eight farms produced milk at less than 5d. per gallon, but there were four farms where the milk was costing more than 6d. per gallon, and one farm where it was costing more than 7d. per gallon for food alone.

A common-sense principle which should underlie every system of feeding is that cows should be fed according to the amount of milk

they yield. The more that is taken out of a cow the more should be returned; in other words, the heavier she milks the more should she be fed, and *vice versa*. Yet it was found that this principle was not always put into practice. Referring to some of the individual herds the Recorder points out that Herd 1 is giving the lowest yield of milk, but there are six other farms where the cost of feeding per day is less. One herd is averaging nearly a gallon of milk per head per day more than Herd 1, and is costing 0·42d. per head per day less to feed.

Another example of over-feeding is seen by comparing Herd A.G. with Herd A. Herd A. is costing nearly 2¾d. per head per day less and is giving practically the same amount of milk.

The Report also contains a considerable amount of information regarding the feeding of dairy cows, composition of foods, and calculation of rations.

5.—*Makers of Modern Agriculture.* By WM. MACDONALD, D.Sc. London: Macmillan & Co. 2s. 6d.

"Lives of great men all remind us
We may make our lives sublime,
And departing leave behind us
Footsteps on the sands of time."

These well-known lines of Longfellow came into our minds as we closed this book. The five brief biographies which it contains had charmed us, not only on account of the intrinsic merit of the men portrayed, but also by the delicate way their portraits had been drawn. And yet it was not so much the men themselves as the work they did which appealed to us.

It is one of our chief human traits to be more interested in men than things, in individuals rather than in events. But both have their attraction, and when the two are combined, as they should be in every biography, and are in these sketches, we obtain a maximum of pleasure. It is mainly because they appeal to this double interest of our nature that novels have such vogue. The characters may be quite imaginary, the events purely mythical, yet they interest us. How much more interesting should be the men and the events upon whose lives and work the farming of to-day is built up.

First and foremost comes Jethro Tull, the forerunner of agricultural science and of agricultural experiments, the man who combined the rare gifts of working well and writing well. Then come the two household names of agriculture—Coke, of Norfolk, and Arthur Young. The former probably the most successful agri-

culturist who ever lived, yet who wrote nothing ; the latter probably the most prolific writer on agriculture who has lived, yet who as a farmer was a complete failure. The fourth essay is devoted to John Sinclair, the founder of the first Board of Agriculture and father of statistical methods of investigation. Lastly, there is an absorbing study of Cyrus H. McCormick, the inventor of the reaping machine, of whom it was said by the savants of the French Academy of Science when they elected him a member that "he had done more for the cause of agriculture than any other living man." It was a wonderful tribute to pay to anyone. Perhaps it would have been more correct to say that he had done more for the cause of *humanity*, inasmuch as the reaper has made it possible for the millions who now inhabit the globe to obtain bread. As the author says :—

> "In the span of his own life the reaper was born and brought to perfection. He created it in a remote Virginian village, and he lived to see his catalogue printed in twenty languages, and to know that so long as the human race continues to eat bread the sun will never set on the Empire of his reaper, for somewhere, in every month, in all the year, you will find the corn white unto the harvest."

How exhilarating it is to read the lives of great men. All seem to have had insurmountable difficulties to overcome—without them, perhaps, they would never have been great. Take even the case of Coke. He was a lawyer, a member of Parliament, and a landowner. Dissatisfied with the poor rent he obtained from his tenants he decided to raise it, and as two of the leases fell in he sent for the two tenants, and offered to renew their leases at a slightly higher figure. Both refused.

> "This curt refusal was enough for a man of Coke's temperament. He forthwith decided to farm the land himself. It was thus that a young man of twenty-two, possessor of a princely fortune, fresh from the salons of Europe, suddenly turned his back on a gay and fashionable world ; and stung into action by the laughter of a lazy tenant, took up the management of a sterile farm, raised a parish from poverty to affluence, transformed a desolate county into a cornfield, and left a name renowned in the annals of English Agriculture."

We would suggest that this small book, one of the most interesting we have read for many a day, should be given as a prize to successful students of agriculture. It could not fail to stimulate them to "Work and Learn."

6.—*Manual of Fruit Insects.* By M. V. SLINGERLAND and C. R. CROSBY. London: Macmillan & Co. 8s. 6d.

For nearly twenty years Professor Slingerland, as assistant Entomologist of the Cornell University Agricultural Experiment Station, devoted the greater part of his time to studying the insect problems encountered by the fruit-growers of New York State. In 1908 he began to write this book, but unfortunately he did not live to complete it, and this task has fallen on the second author.

The book contains a full and practical account of the insects which attack fruits. The life history of each insect, and the injuries which it inflicts, are described, and the best remedial measures which can be taken against it are considered.

It would not be reasonable to expect a farmer or fruit-grower to be cognisant of the various insects which infect his fruit crops. Unfortunately he generally knows far too many as the result of sad experience. Suppose, however, that some new pest appears of which he has had no experience, what is he to do? The purely scientific book is not likely to help him as it presupposes a considerable amount of technical entomological skill and knowledge. Any book likely to assist him must possess certain distinct qualities. First, instead of classifying the pests according to their structure, the classification should be according to the fruits they attack. Secondly, in order to facilitate identification, illustrations, if not essential, are at least most valuable aids. This book satisfies both these requirements. The various fruits are taken in order, apples, pears, plums, currants, gooseberries, strawberries, etc., being thoroughly treated in fourteen chapters, admirably illustrated with about 400 illustrations, mostly from photographs taken by Prof. Slingerland. Many of these are excellent and the publishers deserve credit for the beautiful way in which they have been reproduced.

There are, of course, many insects which infect several different fruits. In such case, the insect is described under the crop where it may be mostly found, and, at the end of each chapter, other insects which affect the fruit under consideration are classified, with a reference to the crop they infest and the page of the book where their description will be found. Thus, in addition to the ordinary plum insects there are no less than forty-one more which attack plums but are described under other fruits. The best methods of dealing with each pest are described, special attention having evidently been paid to this important consideration. There is also a short chapter in which is given the methods of preparing the various Insecticides mentioned in the work.

The insect pests which attack our fruit trees appear to become annually more numerous and more destructive. How to deal with this trouble is certainly one of the problems of the day. Everything depends upon discovering, the moment a pest is visible in any form, what it is and how best to deal with it.

We are of opinion that in no respect could our Agricultural Colleges help the farmers more rapidly and more surely than by identifying, for a nominal fee, any specimen which might be sent them. On a post card, by return of post, the name of the pest should be sent back to the farmer, with, if possible, a note as to the number of the Board of Agriculture leaflet which gives information thereon. But many farmers would also wish to have permanently by them a standard work to which they might refer, and to such we would recommend this exhaustive and practical manual.

7.—*Woburn Experimental Fruit Farm. 14th Report.* By THE DUKE OF BEDFORD and S. U. PICKERING. London: The Amalgamated Press, Ltd. 2s. 9d.

One always looks forward with interest to the appearance of a new Report from the Woburn Fruit Farm, where such excellent work has been done in the past to benefit fruit growers, and the high standard of former reports makes one perhaps anticipate too much. As in the weather so in research work, there are dull days, and it is folly always to expect brilliant results. This may account for the report under consideration being less attractive than usual. None the less it contains valuable information.

The first article is on " Potato Spraying," and herein the Authors give some salutary warnings as to judging the effects of various sprays. They point out that from the results they have obtained

> " it is certain that the appearance of the haulms is an absolutely untrustworthy guide to results ultimately obtained with the tubers, and photographs of sprayed and unsprayed plots can only be regarded as very misleading advertisements for the spraying material used."
>
> " That spraying can destroy all the spores on the leaves, and render the plant quite free from disease, is amply disproved by all the results obtained, and where disease is present, two

effects are produced . . . . on the one hand, the fungoid growth is partially destroyed, but on the other, the haulms are thereby rendered more vigorous and succulent, and they, consequently, present a readier passage for the mycelium from such fungus spores as have not been destroyed. The percentage of diseased tubers can, therefore, be no measure of the general result of the spraying, it is only one of the results, and it may be that, as was conspicuously so in the experiments at the Fruit Farm in 1912, this percentage is actually increased, even doubled by the spraying. Neither can the increase in the total crop, nor even in the sound portion of that crop, be taken as a true measure of the results of the treatment, but it is at any rate, a practical measure, for the yield of sound tubers is the only one which is of value to the grower."

This article deserves careful study, for at the present day the spraying of Potatoes has become a necessity.

The next subject treated is "Trenching," which is also dealt with in an article taken from the "Journal of Agricultural Science," and reproduced in an appendix. The authors state that :—

> "The whole investigation affords an instance of negative conclusions which will be more valuable and acceptable to fruit-growers than positive conclusions would be, for they should in many instances save them from useless expenditure of money in preparing their ground for plantation. In our own case, the whole of the Fruit Farm (with the exception of one or two plots) was hand-trenched in 1894, at a cost of £23 an acre, and, as now appears, all this money was wasted ; certainly, after a year or two, the ground was so far reconsolidated that it was impossible to distinguish the trenched from the untrenched portions, and the trees showed an equal inability to do so, behaving in the same way in both of them."

The third article in this Report does not appear to us convincing. It deals with the "distribution of soil particles," a subject peculiarly difficult to investigate, because the conditions of any laboratory experiments are, and must of necessity be, more or less artificial and not similar to those actually taking place in a soil.

The authors then return to a question which has long attracted their attention, viz., "the effect of one crop upon another." That this effect is very real there can be no doubt ; but, what the actual cause is appears to be still uncertain. The report is interesting, and

the subject well deserving of the labour which has been bestowed upon it.

A very interesting and practically useful report on "Loss in weight of Manure in Transit" deserves the careful study of all purchasers of town stable-manure.

Three lengthy papers in the Appendix, one of which we have already mentioned, are of more scientific interest.

8.—*Dairy Chemistry.* By H. DROOP RICHMOND. London: C. Griffin & Co. 15s.

The sub-title to this book is "a practical handbook for dairy chemists and others having control of dairies." But the book has really a much wider scope, for, although this is its main aim, it gives a fuller statement of our present knowledge of dairy chemistry than can probably be found in any other English work. It is on this account that we draw attention to a book, which is mainly intended for chemists, and especially analysts concerned with milk and milk products. Hence those chapters of the work which deal especially with analytical methods will have but a limited interest, except to the large, and we hope increasing, number of people engaged in dairying who are beginning to recognise that their industry must in the future be more and more based on facts, *i.e.*, science, than it has been in the past. The gradual popularising of Milk Records will also cause an ever increasing number of men to be interested in the methods of milk testing. Instead of being satisfied with the modicum of knowledge which enables them to carry out the necessary tests, we may express the hope that they will study this book, and so obtain a wider insight into the methods of testing milk, and greater knowledge of its composition and properties.

We should like to have seen a description of those tests which may be applied to milk by those actually engaged in dairy practice, to determine its suitability for butter-making or cheese-making. In a future edition the author might with advantage insert some notice of these tests. Such a chapter would give a wider application than it has at present to this very valuable book.

9.—*The Beginner's Garden Book.* By ALLEN FRENCH. London: Macmillan & Co. 4s. 6d.

So many books are published on gardening that it becomes impossible, even if it were desirable, to notice them. There needs to be some special feature to justify attention, for the facts dealt with must necessarily be very similar in all cases.

This book is intended as a text book for the higher classes in schools. It covers the school work indoors and out, and also the work of gardening at home. As the author points out the advantages of interesting children in gardening are twofold. The first is that, whether through an awakened love of flowers or an understanding of the economic value of vegetables, the children, are brought into direct contact with nature, and must necessarily profit, mentally and physically. The second is that children, who might otherwise be idle, are kept busy through the weeks of vacation. This is a suggestion which many parents might appreciate.

The subject is treated under four sections, the autumn work, winter work, gardening under glass, and the real garden; this order being taken to harmonise with the school year.

The purpose of a plant, *i.e.*, to produce seed; the saving of seed; and the preparations necessary for the winter, including potting, are considered in the first section.

The winter's work commences with a study of notes and accounts. The author says:—

> "There are three questions which every gardener ought at all times to be able to answer: The first is, What have you done in the garden? The second is, What have you learned from it? And the third is, What have you gained or lost by it? To answer the first and second, the beginner should always keep a notebook. To answer the third he should keep accounts."

How best to keep a notebook and accounts are then considered. A considerable amount of work would have to be done by the pupils during the winter months, to get through this second section of the book, but then it is all work immensely interesting, alike to old and young. It embraces the study of seeds, their structure, germination and growth, not merely in water cultures, but also in the various ways adopted by gardeners. A little instruction is given on the soil, soil water, and plant chemistry, succeeded by its application in the preparation of seedlings, potting them and protecting them until the time comes to consider, in Section 4, the real garden.

This section, with a very full alphabetical planting list, occupies the greater half of the book and supplies a remarkable amount of useful information. Throughout the book one is struck with the way the author gives just the kind of information which the child is most likely to need. Take as an example the following extract on picking flowers. One can imagine how such instruction would appeal to girls more especially :—

> "When flowers are wanted for the house, they should be picked with care. Buds too young to open, and old blooms which will soon fade, should both be avoided. Pick the just opening blossoms, those which are nearly open, and the flowers which are in early bloom. Thus you will have a bunch which will both show variety and last for some time. Pick with the flower some of its own foliage ; or if this is not in good condition, pick stems and leaves of another plant.
>
> "In the house, arrange the flowers according to their nature. Keep together those of similar colour, or be sure that those of different colours harmonise. For the long-stemmed, choose tall vases ; for the large-flowered, choose large vases or bowls ; for small and short-stemmed, choose small or shallow bowls. Here is where, by the study of problems which change almost from day to day, much taste can be developed. The subject is so large that it cannot all be explained here. But only a little advice can be given.
>
> "Generally speaking, do not crowd the flowers. Make them look as if growing naturally. To this end, the foliage which you have picked will help. Set in among the flowers, it will give the appearance of naturalness, and will prevent crowding. You will improve the arrangement if you shorten some of the stems, so that the flowers appear at varying heights. You can do better, of course, if you have certain helps, which you can buy cheaply. Such are perforated discs of glass : the holes keep the stems upright, and the glass is invisible in water. Such also are pieces of coarse wire netting galvanized, rounded to fit a bowl, and swelling upward in the middle. These, too, help to keep the stems in place. But you yourself can make similar devices. A long ribbon of sheet lead bent into a rosette will help to hold tall flowers upright.
>
> "From a piece of netting you can make a wire frame of your own. But the foliage properly used is almost enough of itself.
>
> "To arrange flowers well is an art which many neglect because they never even heard of it. Flowers, beautiful as they are, show

a little obstinacy when handled wrongly. If merely thrust into a vase, they are likely to refuse to look well. Both the eye and the fingers should be trained to the work. The one who spends an extra minute thinking, and another in arranging, will make her vase look the best. Two watchwords should always be borne in mind during the work. One is naturalness, the other (and it is almost the same) is simplicity.

"The ends of the stems of house flowers should be cut at least every other day (every day is better) and fresh water given. Flowers which are on the point of fading can sometimes be refreshed by putting them in water as hot as the hand can bear. As soon as the flowers fade they should be thrown away. Those which are still good may be re-arranged and others may be cut."

While the book is designed for use in schools, it need not be so confined. Its scope and its practical treatment fit it for the use of all beginners in gardening of whatever age. The work contains over 200 illustrations which greatly add to its interest and utility.

Bath and West and Southern Counties Society.

SWANSEA MEETING, 1914.

JUDGES.

HORSES.

Agricultural.—R. H. KEENE, Westfield, Medmenham, Marlow.

Hunters.—OWEN C. WALLIS, West Haddon Hall, Rugby.

Colliery.—R. H. KEENE, Westfield, Medmenham, Marlow.

Hackneys.—A. ROWELL, West Rudham, King's Lynn.

Ponies.—R. W. FOX, Grimstone, Horrabridge, Devon.

Harness.—A. ROWELL, West Rudham, King's Lynn.

Jumping.—R. H. HARRIES, M.F.H., The Croft, St. Clears, South Wales.

CATTLE.

Devon.—R. COOK, Widhayes, Tiverton, Devon.

South Devon.—J. M. PEEKE, Hernaford, Harbertonford, Totnes.

Shorthorn.—R. W. HOBBS, Kelmscott, Lechlade.

Hereford.—A. P. TURNER, Fayre Oaks, Hereford.

Sussex.—P. CHASEMORE, Ashleigh, Horsham, Sussex.

Welsh Black.—J. W. HARRIES, Pilrhoth, Llanstephan Road, Carmarthen.

Aberdeen-Angus.—REV. C. BOLDEN, Preston Bissett, Buckingham.

Jersey Bulls.—C. C. TUDWAY, The Cedars, Wells, Somerset.

Jersey Cows and Heifers.—H. PADWICK, Manor House, Thorney, Emsworth.

Guernsey.—D. MICHIE, Tichborne Park Estate Office, Alresford, Hants.

Kerry and Dexter.—H. D. BETTERIDGE, Drayton, 301, Woodstock Road, Oxford.

Butter-Tests.—A. F. SOMERVILLE, Dinder House, Wells, Somerset.

SHEEP.

Devon Longwoolled.—C. L. HANCOCK, The Manor Farm, Cothelstone, Taunton.

South Devon.—E. B. LUSCOMBE, Court Farm, Woodleigh, Loddiswell.

Kent or Romney Marsh.—H. J. CHITTENDEN, St. Mary's, New Romney.

Southdown.—H. SENIOR, Heatherland, Colehill, Wimborne, Dorset.

Hampshire Down.—E. J. BENNETT, Chilmark, Salisbury.

Oxford Down.—W. A. TREWEEKE, The Mount, Churchill, Chipping Norton.

Dorset Horn.—F. HOUNSELL, North Farm, Winterbourne Kingston, near Blandford, Dorset.

Dorset Down.—J. SPICER, Bovington, Wool, Wareham.

Exmoor Horn.—T. W. BURNELL, Stichpool, North Molton, Devon.

Welsh Mountain.—W. S. MILLER, Forest Lodge, Brecon.

Ryeland.—D. V. PRICE, 68, Bouverie Road, West, Folkestone, Kent.

PIGS.

Berkshire.—T. CHEETLE, Manor Farm, Reading.

Large Black.—J. WARNE, Treveglos, St. Mabyn, S.O., Cornwall.

Large and Middle White and Tamworth.—A. S. GIBSON, Coldham House, Friday Bridge, Wisbech.

POULTRY.

W. H. COOK, Orpington, Kent; and T. C. HEATH, Keele, Newcastle, Staffs.

PRODUCE.

Cider.—J. BENNETT, Down House, Dursley.

Cheese.—H. M. J. UNDERHILL, 7, High Street, Oxford.

Cream Cheese, Butter and Cream.—Prof. T. CARROLL, 1, Rostrevor Terrace, Rathgar, Dublin.

COMPETITIONS.

Butter-Making.—Prof. T. CARROLL, 1, Rostrevor Terrace, Rathgar, Dublin; and MILES BENSON, British Dairy Institute, Reading.

Milking.—W. J. H. PORTER, Glendale, Wedmore, Somerset.

Shoeing.—F. BAZLEY, M.R.C.V.S., 5, Estcourt Street, Devizes, Wilts.

Timbering and Splicing.—A. G. BROWN, Cambrian Collieries (Ltd.), Clydach Vale, Glam.; and D. F. DAVIES, New Cross Hands Collieries (Ltd.), Cross Hands, Llannon, S.O., Carm.

Forestry.—G. MARSHALL, Estate Office, Godalming.

PRIZE AWARDS, 1914.

*** An animal designated in this list as the "reserve number" is entitled, *conditionally*, to succeed to any prize that may become vacant in its class by reason of the animal placed above it by the Judges failing afterwards to qualify.

† Animals where not otherwise stated, may be considered to have been bred by the Exhibitor.

Abbreviations Explained :—S., sire; d., dam; s. d., sire of dam; y., year; m., month; w., week; d., day; R., Reserve; V.H.C., Very Highly Commended; H.C., Highly Commended; C., Commended.

*** The Prizes marked with an asterisk were given by or through the Swansea Local Committee, and were open only to residents in the Counties of Glamorgan, Carmarthen, Pembroke, Cardigan, Brecon and Radnor.**

HORSES.

SHIRE.

(Registered or eligible for registration in the Shire Horse Society's Stud Book).

Class 1.—*Shire Stallion, foaled before* 1912. [5 entries.]

I. (£15.)—Lord Tredegar, Tredegar Park, Newport, Mon., brown, **Gaer Baronet** (31454), foaled 1908, bred by the late C. D. Phillips, The Gaer, Newport, Mon.; s Gaer Conqueror (25218), d Gaer Pandora (53944), s d Hendre Baronet (16714).

II. (£10) and Special Local Prize "A" **(£5.)***—J. Lewis, Hillend, near Reynoldston, Gower, black, **Lockinge Crown Jewel**, foaled 1906; s Lockinge Forester (19777), d Barberry Queen (2741).

III. (Bronze Medal.)—B. L. Braithwaite, Great House, Newchurch West, near Chepstow, black, **Rowington Thumper** (30849), foaled 1910, bred by T. Horn, Rowington, Warwick; s Friar John (24266), d Bardon Sweet Mary (25276), s d Calwich Heirloom (14547).

Class 2.—*Shire Stallion, foaled in* 1912. [4 entries.]—*First prize*, £15—*second*, £10—*third*, £3.

[No Exhibit.]

CLASS 3.—*Shire Colt, foaled in* 1913. [6 entries.]

I. (**£15.**)—THE DUKE OF WESTMINSTER, Eaton Hall, Chester, bay, **Eaton Fearnone** (Vol. xxxvi.), bred by S. Barker, Beech Lane Farm, Tarporley, Cheshire; s Phenomenon 3rd (18272), d Albert's Rose (43940), s d Burston Albert (15519).

II. (**£10.**)—W. AND H. WHITLEY, Primley Farm, Paignton, bay, **Primley Freeman** (Vol. xxxvi.), bred by D. R. Lloyd, Dinam Fawr, Valley, Anglesey; s Tatton Dray King (23777), d Lolworth Queen (51575), s d Hendre Duke (16178).

III. (**£3.**)—C. MORRIS, Highfield Hall, St. Albans, Herts, bay, **Colney Menestrel** (Vol. xxxvi.), s Norbury Menestrel (23543), d Tandridge Gem (68879), s d King of Tandridge (24351).

R.—LORD POLTIMORE, Poltimore Park, Exeter, bay, **Poltimore Ploughboy**; s Tandridge Perfection (28847), d Lockinge Coquette (42551), s d Buscot Senator (17846).

CLASS 4.—*Shire Mare, in-Foal, or with Foal at foot.* [3 entries.]

I. (**£15.**)—B. L. BRAITHWAITE, Great House, Newchurch West, near Chepstow, bay, **Creslow Sunlight** (56623), foaled 1906, bred by R. Rowland, Creslow, Aylesbury; s Beachendon Royal Harold (19325), d Whitchurch Maroon (30447), s d Prince Harold (14228); with foal by King Cole 7th (26351).

CLASS 5.—*Shire Filly or Gelding, foaled in* 1913. [7 entries.]

I. (**£10**) and **R.** for Special †—W. AND H. WHITLEY, Primley Farm, Paignton, bay filly, **Primley Fantasy** (Vol. xxxvi.), bred by F. W. Griffin, Boro' Fen, Peterborough; s Redlynch Forest King (23626), d Menestrel Forest Queen (61179), s d Norbury Menestrel (23543).

II. (**£5.**)—THE DUKE OF WESTMINSTER, Eaton Hall, Chester, brown filly, **Halstead Duchess 10th** (Vol. xxxvi), bred by J. Bradley, Halstead, Tilton, Leicester; s Eaton Nunsuch (27301), d Halstead Duchess 7th (67224), s d Menestrel (14180).

III. (**£3.**)—W. J. CUMBER, Theale, Berks, black filly, **Theale Lady,** bred by Lord Rothschild, Tring Park, Tring, Herts; s Bridge Sollars Conqueror, d Hendon Lady Menestrel, s d Birdsall Menestrel.

R. and Special Local Prize "D" (**£5.**)*—J. DAVIES, Kenfig House, Margam, Port Talbot, Glam., dark brown filly, **Lymm Laurel,** bred by J. Gould, Lymm, Cheshire; s Clumber Napoleon (29247), d Lymm Flash 2nd (57627), s d Ambush (18475).

H.C. and **R.** for Special Local Prize "D" *—P. O. LAMBTON, Brownslade, Pembroke, bay filly, **Brownslade Forest Star**; s Dewstow Forest King 2nd (27246), d Southhill Star (61895), s d Anchorite (16488).

C.—W. THOMAS, Eglwysnunyd, Margam, Port Talbot, Glam., bay filly, bred by W. Jones, Llanddew Court, Brecon; s Bardon Majestic (28056), d Bramhope Rachel (53250), s d Nyn Hitchin Duke (14782).

† Given by the Shire Horse Society, a Gold Medal, or the sum of £10, for the best Mare or Filly in the Shire Horse Classes, under Condition 48, and to the Breeder of the winner under the Conditions stated, a prize of—£5.

CLASS 6.—*Shire Filly or Gelding, foaled in* 1912. [6 entries.]

I. (**£10.**)—THE DUKE OF WESTMINSTER, Eaton Hall, Chester, filly, **Eaton Melody** (74316), bred by S. Handley, New Hall Farm, Kinnerton, Chester; s Eaton Nunsuch (27301), d Kinnerton Rosebud (60856), s d Phenomenon 3rd (18272).

II. (**£5.**)—W. J. CUMBER, Theale, Berks, chestnut filly, **Stanton Nettas Queen**, bred by G. F. Anstie, Stanton, Chippenham, Wilts; s Stanton Forest King, d Stanton Netta, s d Conqueror's Boy.

III. (**£3.**)—W. AND H. WHITLEY, Primley Farm, Paignton, brown filly, **Belchford Queen** (73390), bred by A. Chatterton, Belchford, Horncastle, Lincs.; s Heale Adonis (25273), d Belchford Duchess (69575), s d Ragged Boy 2nd (22700).

R.—LORD POLTIMORE, Poltimore Park, Exeter, bay filly, **Redwood Mischief,** bred by J. Durman, Redwood Farm, Huntsham, Bampton; s King Cole 7th (26351), d Redwood Flower (72167), s d Blythswood Ray (18535).

H.C. and Special Local Prize "E" (**£5.**)*—E. JONES, Manoravon, Llandilo, brown filly, **Emlyn Forest Lass,** bred by D. Evans, Llwyncadfor, Henllan; s The Forest Chief, d Butter Cup.

C. and **R.** for Special Local Prize "E" *—J. G. AND C. CLEMENT, Scurlage Castle, Reynoldston, S.O., bay filly, **Castle Belle** (11442), bred by R. Knifton, Morley, Derby; s Dewstow Jameson (24185), d Bess (47034), s d Merrie Andrew (18208).

CLASS 7.—*Shire Filly or Gelding, foaled in* 1911. [3 entries.]

I. (**£10**) and Special †—W. AND H. WHITLEY, Primley Farm, Paignton, bay filly, **Rickford Gem** (72188), bred by the Executors of the late Lord Winterstoke, Coombe Lodge, Blagdon, Bristol; s King Cole 7th (26351), d Rickford Dazzle (61641), s d Childwick Champion (22215).

II. (**£5.**)—C. MORRIS, Highfield Hall, St. Albans, Herts, bay filly, **Birkholme Laurel** (69671), bred by J. E. Thurman, Birkholme House, Grantham; s Childwick Champion (22215), d Monk's Mabel (26510), s d Carlton Banker (9017).

III. (**Bronze Medal.**)—W. J. CUMBER, Theale, Berks, bay, **Willnott's Muriel,** bred by E. A. Poynter, Starborough Stud Farm, Edenbridge; s Hendre Champion, d Starborough Regent, s d Marden Harold.

ANY AGRICULTURAL BREED.

CLASS 8.—*Mare or Gelding, suitable for general work, given by the Swansea Local Committee, and open only to residents within a radius of* 20 *miles of Swansea Post Office.* [4 entries.]

I. (**£5**) and Special Prize "G" ‡—WEAVER AND CO., LTD., Swansea Flour Mills, Swansea, bay gelding, **Beaufort Boy,** foaled 1910.

† Given by the Shire Horse Society, a Gold Medal, or the sum of £10, for the best Mare or Filly in the Shire Horse Classes, under Condition 48, and to the Breeder of the winner under the Conditions stated, a prize of—£5.

‡ Special Prize "G."—The Swansea Horse Show Society's Silver Cup. Given by Sir John T. D. Llewellyn, Bart.

II. (**£2**) and **R.** for Special Prize "G" †—CORKER AND BEVAN, LTD., Victoria Road, Swansea, roan gelding, **Freeby Prince,** foaled 1909, bred by T. Wilson, The Grange, Freeby, Melton Mowbray.

III. (**£1.**)—WEAVER AND CO., LTD., bay gelding, **Monitor,** foaled 1906, bred by Miss Mansel, Llandilo; s Monitor.

COLLIERY.

CLASS 9.—*Mare in-foal or with foal at foot, not exceeding* 15.1 *hands.* [2 entries.]

I. (**£4.**)—J. H. JAMES, Cefngolen Farm, Gowerton.

CLASS 10.—*Filly or Colt, foaled in* 1911, 1912 *or* 1913. [4 entries.]

I. (**£4.**)—LADY LYONS, Kilvrough, Parkmill, Glam., black, **Kilvrough Forest King,** foaled 1911, bred by D. Joseph, Brynafel, Parkmill, Glam.; s Castellan Forest King, d Queen B, s d Lockinge Albert.

II. (**£2.**)—D. J. PERKINS, Commercial Hotel, Killay, bay mare, **Queenie,** foaled 1912, bred by P. Lewis, Pant Glas, Mydrim, St. Clairs; s Monitor 3rd, d Isabella, s d Buccaneer 3rd.

III. (**£1.**)—H. AND J. GORDON, Tyle House Farm, Reynoldstone, Swansea, black, **Tylehouse Landmarker,** foaled 1912; s Monitor, d Duchess, s d Emlyn Harold.

R.—J. H. JAMES, Cefngolen Farm, Gowerton, bay filly, **Queen**; s Castell Du Forest King, d Ferry.

HUNTERS.

CLASS 11.—*Hunter Mare, in-Foal, or with Foal at foot.* [2 entries.]

I. (**£15**) and Special ‡—E. W. ROBINSON, Liscombe, Leighton Buzzard, Beds., brown, **Vademecum,** foaled 1903, bred by R. Downes; s Hackler, d Verily, s d Stylites; with foal by The Tower.

II. (**Silver Medal**) and Special Local Prize "H" (**£5.**) *—J. WILLIAMS, Eithin-duonissa, Mydrim, St. Clears, Carmarthen, chestnut, **Miss Buckley** (3570), foaled 1906, bred by J. Sheean, Mallow, Ireland; s Whalmsgate (Vol. xvii., p. 215, G.S.B.), d Huntress, s d Republican; with foal by Captain Jack.

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† Special Prize "G."—The Swansea Horse Show Society's Silver Cup. Given by Sir John T. D. Llewellyn, Bart.

‡ Given by the Hunters' Improvement and National Light Horse Breeding Society, under Conditions 49 and 50, a Gold Medal, or £5 and a Bronze Medal, for the best Hunter Brood Mare in Class 11 registered with a number in the Hunter Stud Book at the time of entry or within a month of the award, not having previously won the above-named Society's Gold Medal as a Brood Mare in 1914, and which must have her foal at foot, or produce a living foal in 1914 to a thoroughbred horse or Registered Hunter sire. In the second instance a certificate to that effect must be forwarded before the Medal is sent. Only prize-winners in the Class were eligible for the medals.

CLASS 12.—*Hunter Filly, Colt, or Gelding, foaled in* 1913. [5 entries.]

I. (£10.)—E. W. ROBINSON, Liscombe, Leighton Buzzard, Beds., bay filly, **Dorothea**; s Hackenschmidt, d Dorothy, s d Bumptious.

II. (£5.)—W. HADDON, Havelock House, Honor Oak Road, Forest Hill, S.E., chestnut colt, **Pytchley Pride**; s Drummond's Pride, d Kathleen 9th.

III. (Bronze Medal) and Special Local Prize "I" (**£5.**) *—J. WILLIAMS, Eithinduonissa, Mydrim, St. Clears, Carmarthen, chestnut filly, **Sunshine 5th** (4888); s Lousby, d Merry Sunshine (4887), s d Gold Medallist.

R.—D. DAVIES, M.P., M.F.H., Broneirion, Llandinam, Co. Montgomery, black filly, **Irish Gal** (4894); s Ballinasloe (84), d Irish Slavey (3460), s d Marmiton.

CLASS 13.—*Hunter Filly, Colt or Gelding, foaled in* 1912. [5 entries.]

I. (£10.)—LORD TREDEGAR, Tredegar Park, Newport, Mon., bay gelding, **St. George**; s St. Pancras, d Pretoria (3642 H.I.S.), s d Gordon.

II. (£5.)—S. ASHBY, Rivernook Farm, Wraysbury, Bucks., chestnut colt, **Dromkerry 168th** (Vol. vii., H.S.B.), bred by J. Neill, The Park, Killarney, Co. Kerry; s Master Bill, d Glena (4906), s d Glenvannon.

III. (Bronze Medal.)—W. L. BARTON, Coln St. Aldwyn, Fairford, Glos., chestnut gelding, **Thistle**; s Thistledown, d Santoy (4892 H.S.B.).

R.—D. DAVIES, M.P., M.F.H., Broneirion, Llandinam, Co. Montgomery, chestnut gelding, **Lorenzo**; s Ballinasloe (84), d Florence (3406), s d May Boy.

CLASS 14.—*Hunter Filly or Gelding, foaled in* 1911. [4 entries.]

I. (£10.)—J. L. NICKISSON, Hinton Manor, Swindon, chestnut filly, **Red Squaw**; s Red Sahib, d Sister Anne, s d Pantomime.

II. (£5.)—LORD TREDEGAR, Tredegar Park, Newport, Mon., bay gelding, **Marksman**, bred by Col. Walker, Hall Green, Birmingham; s Silver King, d Mutter (3595), s d Whisperer.

III. (Bronze Medal.)—D. DAVIES, M.P., M.F.H., Broneirion, Llandinam, Co. Montgomery, bay (white star) filly, **Florodora 2nd** (4314); s Pedlar Brand, d Florence (3406), s d May Boy.

CLASS 15.—*Hunter Mare or Gelding, foaled in* 1910. [2 entries.]

I. (£10.)—J. K. STEVENSON, 5, Great Northern Street, Huntingdon, chestnut gelding, **Combat**; s Battlefield, s d The Moor.

CLASS 16.—*Mare or Gelding, foaled before* 1911, *to carry under* 14 *stone.* [5 entries.]

I. (£20.)—J. H. STOKES, Great Bowden, Market Harborough, chestnut gelding, **Buffoon,** foaled 1909; s Bonarosa, s d Soloman.

II. (£10.)—J. E. CLEGG, The Starkies, Bury, grey gelding, **Kilts,** foaled 1909; s Scotch Sign.

III. (**Bronze Medal.**)—Miss Davies, Plas Dinam, Llaninam, Co. Montgomery, chestnut gelding, **Cark Apollo,** foaled 1909 ; s Sweet John, d Mavourneen.

R.—J. K. Stevenson, 5, Great Northern Street, Huntingdon, dark bay gelding, **Bythorn,** foaled 1908.

Class 17.—*Hunter Mare or Gelding, foaled before* 1911, *to carry* 14 *stone or over.* [5 entries.]

I. (**£20**) and Special †—J. K. Stevenson, 5, Great Northern Street, Huntingdon, chestnut gelding, **Syntax,** foaled 1909, bred by Lord Middleton, Birdsale, Malton, Yorks ; s Wales, d Sympathy (2531), s d Gordon.

II. (**£10.**)—J. E. Clegg, The Starkies, Bury, chestnut gelding, **Cock Robin,** foaled 1909 ; s Landsman.

III. (**Bronze Medal.**)—T. L. Bennett, Cross Hands Farm, Chipping Sodbury, chestnut gelding, **Comedy,** foaled 1908, bred by — Hancock, Wexford, Ireland ; s Red Prince 2nd, s d Ballynoe.

Class 18.—*Hunter Mare or Gelding, foaled before* 1911, *that had not won a Prize of* £10 *or over under Saddle at any Show held previous to April* 10, 1914. [6 entries.]

I. (**£10.**)—J. K. Stevenson, 5, Great Northern Street, Huntingdon, chestnut gelding, **Syntax,** foaled 1909, bred by Lord Middleton, Birdsale, Malton, Yorks ; s Wales, d Sympathy (2531). s d Gordon.

II. (**£5.**)—J. E. Clegg, The Starkies, Bury, chestnut gelding, **Cock Robin,** foaled 1909 ; s Landsman.

III. (**£3.**)—Miss Davies, Plas Dinam, Llaninam, Co. Montgomery, chestnut gelding, **Cark Apollo,** foaled 1909 ; s Sweet John, d Mavourneen.

R.—J. K. Stevenson, 5, Great Northern Street, Huntingdon, chestnut gelding, **Combat** ; s Battlefield, s d The Moor.

HACKNEYS.

(Registered or eligible for registration in the Hackney Horse Society's Stud Book).

Class 19.—*Hackney Mare, in-Foal, or with Foal at foot.* [1 entry.]

I. (**£10**) and Special Local Prize "M" (**£5.**) * and Special ‡—E. Jones, Manoravon, Llandilo, brown, **Towyvale Princess,** foaled 1904, bred by D. Evans, Llwyncadfor, Henllan ; s Middleton Relish, d Miggs ; with foal by Admiral Crichton.

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† Given by the Hunters' Improvement and National Light Horse Breeding Society under Conditions 49 and 50, a Silver Medal, or £1 (at the option of the winner), for the best Hunter Mare or Gelding of any age, exhibited by a member of the Hunters' Improvement and National Light Horse Breeding Society, whose subscription to that Society must be paid within a month of the award. Only prize-winners in the Class were eligible for the medals.

‡ Given by the Hackney Horse Society, a Silver Medal for the best Mare or Filly exhibited in Class 19 or 20, under Condition 51.

CLASS 20.—*Hackney Filly, Colt, or Gelding, foaled* 1912 *or* 1913. [3 entries.]

I. (£10) and Special Local Prize "N" (£5)*—D. J. THOMAS, Carregcegin Stud, Llandilo, Carm., brown colt, **Hamlet A1,** foaled 1912, bred by B. Oakes, Hilden Paddocks, Ropley; s Lord Hamlet (3750), d Dewdrop (10832), s d Lord Denby 2nd.

II. (£5.)—W. J. GORDON, Renrallt, Llanrhidian, Reynoldston, chestnut colt, **Pen Simon,** foaled 1912; s Bryngwill Aviator, d Lady Dormithorne, s d Dormithorne.

III. (**Bronze Medal**).—T. MATHIAS, Old Black Horse, Pontardulais, chestnut colt, **Highfield Liberty,** foaled June, 1913; s St. Simon (7594), d Hornfoot (11016), s d Clifton 2nd.

PONIES.

CLASS 21.—*Pony Stallion, not exceeding* 15 *hands, suitable to get Polo or Riding Ponies.* [1 entry.]

I. (£8.)—SIR J. BARKER, BART., The Grange, Bishops Stortford, Herts, bay, **Arthur D.** (593), foaled in 1908, bred by R. Botterill; s Pride, d Magnay, s d Florentine.

(The Prizes in Class 22 were given by the Swansea Local Committee).

CLASS 22.—*Mountain Stallion not exceeding* 12.2 *hands, to be shown in hand.* [4 entries.]

I. (£4.)—R. H. SAMPSON, Bryngwili, Pontardulais, bay, **Bryngwili Bright Light** (Vol. xiii., W.P.S.B.), foaled 1910, bred by Dr. W. C. Griffiths, Pontardulais; s Dyoll Starlight, d Gwladys.

II. (£2.)—E. JONES, Manoravon, Llandilo, grey, **Towyvale Freckles,** bred by D. Evans, Porth Hotel, Llandussil; s Cymree Fydd, d Pride of Greylight.

III. (£1.)—D. R. WILLIAMS, Borthyn, Llanwrda, Carmarthenshire, very dark grey (with white markings), **Ap. Starlight** (587 W.S.B.), foaled 1911; s Dyoll Starlight (4 W.S.B.), d Mina (3968 W.S.B.), s d Aberedw.

R.—MISS D. C. VIVIAN, Clyne Castle, Blackpyl, dark bay, **Robinson Crusoe** (4 S.B. No. 547), foaled 1909, bred by W. G. Vivian (dec.), Clyne Castle, Blackpyl; s Dick Hill (W.S.B. No. 49), d Good Friday (Vol. vi., No. 1745).

CLASS 23.—*Pony Mare, not exceeding* 14.2 *hands, suitable to breed Polo or Riding Ponies, in-foal, or with foal at foot.* [1 entry.]

I. (£8.)—SIR J. BARKER, BART., The Grange, Bishops Stortford, Herts., chestnut, **Red Stone** (1786); with foal by Right For'ard.

(The Prizes in Class 24 were given by the Swansea Local Committee).

CLASS 24.—*Mountain Mare, not exceeding* 12.2 *hands, in-foal, or with foal at foot.* [10 entries.]

I. (**£4.**)—MISS E. C. V. HUGHES, Bryn Hawddgar, Llanarthney, Carmarthenshire, grey (nearly white), **Hawddgar Dewdrop** (1491 W.S.B.), foaled 1903, bred by H. H. Lloyd, Delfryn, Llanwrda, Carmarthenshire; s Dyoll Starlight (4 W.S.B.), d Dyoll Crystal (606 W.S.B.); with foal by Hawddgar Mountain Chief.

II. (**£2.**)—JONES BROS., 6, Pant Road, Dowlais, Glam., grey, **Morlais Twilight,** foaled 1910, bred by T. S. Clarke, Tynewydd, Llangunnor, Carmarthen; s Dyoll Starlight (4 W.S.P.), d Gwenlight, s d Starlight; with foal by Blethfa Shooting Star.

III. (**£1.**)—D. DAVID, Mynyddbachyga, Waunlorlwydd, Gowerton, black, **Gwalia Maid,** foaled 1907; with foal by Macaulay.

R. and Special† (**£2 2s.**)—H. MORRIS, Kittle, Bishopston, near Swansea, **Kittle Queenie** (late **Hawddgar Goldfinder**), foaled 1909, bred by Miss Hughes, Llanarthney, Carmarthenshire; d Longwrynd Berrow; in-foal.

CLASS 25.—*Welsh Mountain Mare, not exceeding* 12.2 *hands.* [8 entries.]

I. (**£8.**)—MISS E. C. V. HUGHES, Bryn Hawddgar, Llanarthney, Carmarthenshire, grey (nearly white), **Hawddgar Dewdrop** (1491 W.S.B.), foaled 1903, bred by H. H. Lloyd, Delfyn, Llanwrda, Carmarthenshire; s Dyoll Starlight (4 W.S.B.), d Dyoll Crystal (606 W.S.B.); with foal by Hawddgar Mountain Chief.

II. (**£4.**)—JONES BROS., 6, Pant Road, Dowlais, Glam., grey, **Morlais Twilight,** foaled 1910, bred by T. S. Clarke, Tynewydd, Llangunnor, Carmarthen; s Dyoll Starlight (4 W.S.B.), d Gwenlight, s d Starlight; with foal by Blethfa Shooting Star.

III. (**£2.**)—R. H. SAMPSON, Bryngwili, Pontardulais, grey, **Bryngwili Blodwen** (W.P.S.B. Vol. xiii.), foaled 1904, bred by H. M. Lloyd, Llanwrda; s Dyoll Starlight (Vol. i., 4).

R.—D. DAVID, Mynyddbachyga, Waunlorlwydd, Gowerton, black, **Gwalia Maid,** foaled 1907; with foal by Macaulay.

CLASS 26.—*Pony Filly, Colt or Gelding, foaled in* 1912, *not exceeding* 14.2 *hands.* [1 entry.]

I. (**£8.**)—SIR J. BARKER, BART., The Grange, Bishops Stortford, Herts., bay filly, **Lady Pixie**; s Othrae (447), d Pixie (1615), s d Marmiton.

† Special prize given by F. F. Mason, Esq., best exhibit in Class 24, the property of a member of the Fairwood Mountain Pony Association.

CLASS 27.—*Pony Filly, Colt or Gelding, foaled in* 1911, *not exceeding* 14.2 *hands.* [1 entry.]

I. (**£8.**)—J. S. BAKEWELL, Cromhall, Charfield, Glos., chestnut filly, **Flu** (see Supp. N.P.S.S.B.), ; s White Wings (464), d Snuffles (2167).

(The Prizes in Class 28 were given by the Swansea Local Committee).

CLASS 28.—*Mountain Filly or Colt, foaled in* 1912 *or* 1913, *not exceeding* 12.2 *hands.* [5 entries.]

I. (**£4**) and Special†—H. MORRIS, Kittle, Bishopston, near Swansea, bay colt, **Curiosity** (late **Hawddgar Cymro**), foaled 1912, bred by Miss Hughes, Llanarthney ; s Dyoll Starlight, d Hawddgar Spinaway, s d Shooting Star.

II. (**£2**) and **R.** for Special†—HON. O. VIVIAN, Glanrafon, Sketty, Glam., grey colt, **Rainbow 2nd,** foaled 1912, bred by Mrs. H. D. Greene, Grove, Craven Arms ; s Grove Rainbow (345 W.S.B.), d Grove Gaslight (1513 W.S.B.), s d Dyoll Starlight.

III. (**£1.**)—MESSRS. JONES BROS., 6, Pant Road, Dowlais, Glam., red roan colt, **Morlais Dazzler,** born 1912 ; s Cream of Eppynt (W.S.B. 344), d Mountain Gypsy, s d Express Lion.

MEDALS.

GIVEN BY THE NATIONAL PONY SOCIETY.

A Silver Medal for the best Polo Pony Brood Mare in the Brood Mare Classes, registered or eligible for registration in the Stud Book.

SIR J. BARKER, BART., The Grange, Bishops Stortford, Herts, chestnut, **Red Stone** (1786) ; with foal by Right For'ard.

A Silver Medal for the best Polo Pony Stallion, registered or eligible for registration in the Stud Book ; or best Polo Pony Entire Colt, one, two or three years old, entered or eligible for the Supplement, viz., by a Registered or Entered Sire, or out of a Registered or Entered Dam.

SIR J. BARKER, BART., The Grange, Bishops Startford, Herts, bay, **Arthur D,** (593), foaled in 1908, bred by R. Botterill ; s Pride, d Magnay, s d Florentine.

A Bronze Medal for the best Foal, entered or eligible for the Supplement, viz., by a Registered Sire, or out of a Registered or Entered Dam.

SIR J. BARKER, BART., The Grange, Bishops Stortford, Herts, chestnut, **Red Stone** (1786) ; with foal by Right For'ard.

† Given by Col. J. R. Wright, D.L., J.P., a Silver Cup, value £10 for the best Mountain Pony exhibited by a Member of the Fairwood Mountain Pony Association.

HARNESS.

CLASS 29.—*Mare or Gelding, not over* 14.2 *hands, driven in harness on the first day of Show.* [4 entries.]

I. (£10.)—C. RADCLIFFE, 19, Newport Road, Cardiff, mare, **Peterston Pearl.**

II. (£5.)—D. R. JONES, Penbryn Stud, Aberdare, bay mare, **Bromley Belle**; s Sir Horace.

III. (Bronze Medal.)—T. J. MATHIAS, Llysmyeddin, Cardigan, chestnut mare, **Gay Girl.**

R.—G. PHILLIPS, Bronheulog, Ferndale, bay, **Sir Horace,** bred by J. Howell, Llanmeas Stud Farm, Cardiff.

CLASS 30.—*Tandems (Mares or Geldings), driven in harness on the first day of Show.* [1 entry.]

I. (£10.)—T. J. MATHIAS, Llysmyeddin, Cardigan, chestnuts, **Gay Girl** and **Flash.**

CLASS 31.—*Mare or Gelding, over* 14.2 *hands driven in harness on the first day of Show.* [13 entries.]

I. (£5.)—RICHARDS BROS., Jewellers, Swansea, black mare, **Simonetta,** bred by D. O. John, Glyn Stud Farm, Brynamman; s St. Simon, d Sceptre.

II. (£3.)—G. PHILLIPS, Bronhenlog, Ferndale, black chestnut, **Mathias Reality.**

III. (£1.)—G. J. THOMAS, Carregcegin Stud, Llandilo, Carm., dark chestnut mare, **Hilden Snowflake** (22061), foaled 1910, bred by B. Oakes, Hilden Paddocks, Ropley; s Mathias (6473), d Dewdrop (10832), s d Lord Denby 2nd.

R.—D. R. JONES, Penbryn Stud, Aberdare, black gelding, **Penbryn Star,** foaled 1910; s St. Simon.

H.C.—J. WHITE, Black Horse Hotel, Pontardulais, bay gelding, **Sunstar,** foaled 1909, bred by J. Griffiths, Bankyberllan; s St. Simon (7594).

C.—E. WILLIAMS, Nantymilor, Morriston, Glam., chestnut gelding, **Revelation,** foaled 1909, bred by Sir G. Greenall, Bart., Warrington; s Nene Majestic, d Terrington Modesty.—T. J. MATHIAS, Llysnyeddin, Cardigan, brown, **Fashion.**

CLASS 32.—*Mare or Gelding,* 15 *hands or over, driven in harness on the second day of Show.* [6 entries.]

I. (£10.)—MRS. T. GLENCROSS, The Loose Box, Weston-super-Mare, brown, gelding, **Red Hill King.**

II. (£5.)—T. J. MATHIAS, Llysmyeddin, Cardigan, bay mare, **Simona.**

III. (£2.)—D. R. JONES, Penbryn Stud, Aberdare, black gelding, **Penbryn Star,** foaled 1910; s St. Simon.

R.—J. WHITE, Black Horse Hotel, Pontardulais, bay gelding, **Sunstar,** foaled 1909, bred by J. Griffiths, Bankyberllan; s St. Simon (7594).

CLASS 33.—*Pair of Carriage Horses (Mares or Geldings), driven in double harness on the second day of Show.* [1 entry.]

I. (**£10.**)—T. J. MATHIAS, Llysmyeddin, Cardigan, chestnuts, **Gay Girl** and **Flash.**

(The Prizes in Class 34 were given by the Swansea Local Committee).

CLASS 34.—*Mare or Gelding, not over* 14.2 *hands, driven in harness on the second day of Show.* [7 entries.]

I. (**£5.**)—C. RADCLIFFE, 19, Newport Road, Cardiff, mare, **Peterston Pearl.**

II. (**£3.**)—D. R. JONES, Penbryn Stud, Aberdare, bay mare, **Bromley Belle** ; s Sir Horace.

III. (**£1.**)—T. J. MATHIAS, Llysmyeddin, Cardigan, chestnut, mare, **Gay Girl**

R.—G. PHILLIPS, Bronheulog, Ferndale, bay, **Sir Horace,** bred by J. Howell, Llanmeas Stud Farm, Cardiff.

CLASS 35.—*Mare or Gelding, over* 14.2 *and under* 15 *hands, driven in harness on the third day of Show.* [6 entries.]

I. (**£10.**)—A. BUTCHER, George and Railway Hotel, Bristol, brown mare, **Lady Gordon.**

II. (**£5.**)—RICHARDS BROS., Jewellers, Swansea, black mare, **Simonetta,** bred by D. O. John, Glyn Stud Farm, Brynamman ; s St. Simon, d Sceptre.

III. (**£2.**)—G. PHILLIPS, Bronhenlog, Ferndale, black chestnut, **Mathias Reality.**

R.—G. J. THOMAS, Carregcegin Stud, Llandilo, Carm., dark chestnut mare, **Hilden Snowflake** (22061), foaled 1910, bred by B. Oakes, Hilden Paddocks, Ropley ; s Mathias (6473), d Dewdrop (10832), s d Lord Denby 2nd.

C.—E. WILLIAMS, Nantymilor, Morriston, Glam., chestnut gelding, **Revelation,** foaled 1909, bred by Sir G. Greenall, Bart., Warrington ; s Nene Majestic, d Terrington Modesty.—T. J. MATHIAS, Llysmyeddin, Cardigan, brown, **Fashion.**

CLASS 36.—*Trotting. Best Mare, Stallion or Gelding, under* 15 *hands, for speed, driven in harness on the third day of Show.* [3 entries.]

I. (**£10.**)—W. WINANS, Surrenden Park, Pluckley, Kent, bay mare, **Topsy,**

II. (**£5.**)—H. MORRIS, Kittle, Bishopston, near Swansea, dark brown gelding, **Moggy.**

III. (**Bronze Medal.**)—LADY LYONS, Kilorough, Parkmill, Glam., bay mare, **Kathleen,** foaled 1906.

(The Prizes in Classes 37 to 43 were given by the Swansea Local Committee).

CLASS 37.—*Tandems (Mares or Geldings), not over* 14.2 *hands, driven in harness on the third day of Show.* [1 entry.]

I. (£5.)—T. J. MATHIAS, Llysmyeddin, Cardigan, chestnuts, **Gay Girl** and **Flash.**

CLASS 38.—*Cart Mare or Gelding, the property of a Tradesman carrying on business within a radius of six miles from Swansea Post Office, used solely by him, and driven regularly by himself or his servants for the delivery of goods sold by him, for a period of not less than three months prior to May* 28, 1914, *and shown in a wagon, trolley, or cart, on the fourth day of Show.* [10 entries.]

I. (£5) and Special†—CORKER ANH BEVAN, LTD., Victoria Road, Swansea, roan gelding, **Freeby Prince,** foaled 1909, bred by T. Wilson, The Grange, Freeby, Melton Mowbray.

II. (£2.)—WEAVER AND CO., LTD., Swansea Flour Mills, Swansea, bay gelding, **Monitor,** foaled 1906, bred by Miss Mansel, Llandilo ; s Monitor.

III. (£1.)—POWLESLAND AND MASON, Swansea, bay gelding, **King,** foaled 1907.

IV. (10s. 6d.)—THOMAS AND EVANS AND JOHN DYER, LTD., Swansea, gelding, **Prince.**

H.C.—POWLESLAND AND MASON, bay gelding, **Prince,** foaled 1909.

C.—W. REES, Hay and Corn Stores, Brynhyfryd, Swansea, roan mare, **Darling,** foaled 1909.

CLASS 39.—*Light Mare or Gelding,* 14.3 *hands and over, the property of a Tradesman carrying on business within a radius of six miles from Swansea Post Office, used solely by him and driven regularly by himself or his servants for the delivery of goods sold by him, for a period of not less than three months prior to May* 28, 1914, *and shown in a trade cart (not dog cart), on the fourth day of Show.* [4 entries.]

I. (£5) and Silver Cup*—W. SAMUEL, St. Cadog Dairy, Swansea, bay mare, **Lady Mac,** foaled 1907; s Macaulay (7182), d Black Bess, s d Cardigan Comet.

II. (£2.)—H. M. PALMER, 42, Marlborough Road, Brynmill, chestnut gelding, **Singleton Lad,** bred by — Harris, Singleton Farm ; s McColly, d San Toy.

III. (£1.)—E. WILLIAMS AND CO., 16, Heathfield Street, Swansea, light bay mare, **Miss Mayo,** foaled 1905, bred by J. Hopkins, Tyrsat, Llandebir ; s Confident (936 H.S.B.), d Pollyamon, s d Cardigan Comet 2nd.

IV. (10s. 6d.)—S. SORENSEN, 23, Bryn-y-mor Road, Swansea, dark bay mare, **Kitty,** aged.

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† Given by Col. J. R. Wright, D.L., J.P., a Silver Cup, value £10, for the best exhibit in Class 38.

CLASS 40.—*Light Mare or Gelding, under* 14.3 *hands, the property of a Tradesman carrying on business within a radius of six miles from Swansea Post Office, used solely by him and driven regularly by himself or his servants for the delivery of goods sold by him, for a period of not less than three months prior to May* 28, 1914, *and shown in a trade cart (not dog cart), on the fourth day of Show.* [8 entries.]

I. (£5) and Silver Cup*—A. E. EDWARDS, The District Supply Stores, Morriston, chestnut mare, **White Heather,** foaled 1906, bred by the Hon. O. Vivian, Sketty; s Macaulay, d San Toy.

II. (£2.)—D. DAVIES, Borough Stores, Swansea, chestnut gelding, **Charlie.**

III. (£1.)—F. GAMBOLD, 1, Rhondda Street, Swansea, grey horse, **Milk Boy,** foaled 1910, bred by T. Seurlock, Lanlash, Golden Grove; s Severn End, d Lady Grey.

IV. (10s. 6d.)—G. EVANS, 8, Burman Street, Swansea, bay horse, **Rob Roy,** foaled May, 1904, bred by V. Kay, Owlerton, Sheffield; s Parbold Snorer.

R.—HEARD'S STORES, LTD., Orchard Street, Swansea, bay gelding, **Torchlight,** foaled 1910, bred by J. Martin, Hunter Street, Briton Ferry; s Torchfire.

H.C.—J. KELLY, 25, Argyle Street, Swansea, chestnut mare, **Bess,** foaled 1908.

CLASS 41.—*Mare or Gelding, over* 14.2 *hands, shown in Saddle on the fourth day of Show.* [9 entries.]

I. (£5.)—RICHARDS BROS., Jewellers, Swansea, black mare, **Simonetta** bred by D. O. John, Glyn Stud Farm, Brynamman; s St. Simon, d Sceptre.

II. (£3.)—G. J. THOMAS, Carregcegin Stud, Llandilo, Carm., dark chestnut mare, **Hilden Snowflake** (22061), foaled 1910, bred by B. Oakes, Hilden Paddocks, Ropley; s Mathias (6473), d Dewdrop (10832). s d Lord Denby 2nd.

III. (£1.)—J. WHITE, Black Horse Hotel, Pontardulais, bay gelding, **Sunstar,** foaled 1909, bred by J. Griffiths, Bankyberllan; s St. Simon (7594).

R.—DR. HUMPHREYS, Northampton Lodge, Swansea, strawberry roan mare, **Doreen,** foaled 1907.

C.—S. SORENSEN, 23, Bryn-y-mor Road, Swansea, dark bay mare, **Kitty,** aged.

CLASS 42.—*Mare or Gelding not over* 14.2 *hands, shown in Saddle on the fourth day of Show.* [3 entries.]

I. (£5.)—RICHARDS BROS., Jewellers, Swansea, bay mare, **Winona**; s Tregaron Horace, d Simonetta.

II. (£3.)—G. EVANS, 8, Burman Street, Swansea, bay horse, **Rob Roy,** foaled May, 1904, bred by V. Kay, Owlerton, Sheffield; s Parbold Snorer.

III. (**£1.**)—F. Gambold, 1, Rhondda Street, Swansea, grey horse, **Milk Boy**, foaled 1910, bred by T. Seurlock, Lanlash, Golden Grove; s Severn End, d Lady Grey.

Class 43.—*Trotting. Best Mare, Stallion or Gelding, any height, for speed, driven in harness on the fourth day of Show.* [3 entries.]

I. (**£5.**)—T. Williams, 11, Park Lane, Aberdare, dark brown mare, **School Girl**.

II. (**£3.**)—H. Morris, Kittle, Bishopston, near Swansea.

III. (**£1.**)—Lady Lyons, Kilorough, Parkmill, Glam., bay mare, **Kathleen**, foaled 1906.

Class 44.—*Mare or Gelding, not over* 13.2 *hands, driven in harness on the fifth day of Show.* [4 entries.]

I. (**£10.**)—Heard's Stores, Ltd., Orchard Street, Swansea, bay gelding, **Torchlight**, foaled 1910, bred by J. Martin, Hunter Street, Briton Ferry; s Torchfire.

II. (**£5.**)—T. J. Mathias, Llysmyeddin, Cardigan, bay-brown horse, **Llew**.

Class 45.—*Trotting. Best Mare, Stallion, or Gelding,* 15 *hands or over, for speed, driven in harness on fifth day of Show.* [4 entries.]

I. (**£10.**)—W. Winans, Surrenden Park, Pluckley, Kent, black gelding, **Lyric**, foaled in 1897, bred by Baugherty Bros., Wabash, Indianna, U.S.A.; s Poen, d Fashion, by Prince Nutwood.

II. (**£5.**)—G. M. Beresford-Webb, Norbryght, South Godstone, Surrey, black stallion, **Magic Chimes**, foaled 1901, bred by Village Farm, E. Aurora, N.Y., U.S.A.; s Chimes, d Princess Ruth, s d Mambrino King.

III. (**Bronze Medal**).—H. Morris, Kittle, Bishopston, near Swansea.

(The Prizes in Class 46 were given by the Swansea Local Committee).

Class 46.—*Mare or Gelding not over* 13.2 *hands, driven in harness on the fifth day of Show.* [5 entries.]

I. (**£5.**)—G. Evans, 8, Burman Street, Swansea, bay horse, **Rob Roy**, foaled May, 1904, bred by V. Kay, Owlerton, Sheffield; s Parbold Snorer.

II. (**£3.**)—Heard's Stores, Ltd., Orchard Street, Swansea, bay gelding, **Torchlight**, foaled 1910, bred by J. Martin, Hunter Street, Briton Ferry; s Torchfire.

III. (**£1.**)—T. J. Mathias, Llysmyeddin, Cardigan, bay-brown horse, **Llew**.

R.—W. John, Tyllant, Neath, bay mare, **Lady Quayle**, foaled 1910, bred by G. Rolling, Hill Top House; s Prospector, d Quayle, s d Sir Horace.

JUMPING.

CLASS 47.—*Mare or Gelding,* 15 *hands and over, jumping over the course in the best form on the first day of Show.* [16 entries.]

I. (£10.)—T. AND W. SINGER, High House, Corsley, Warminster, **Springbok.**

II. (£5.)—A. MERRETT, Southgate Street, Gloucester.

III. (£2.)—T. GLENCROSS, The Loose Box, Weston-super-Mare, bay mare, **Blink Bonny.**

CLASS 48.—*Mare or Gelding, under* 15 *hands, jumping over the course in the best form on the first day of Show.* [7 entries.]

I. (£10.)—S. PHELPS, Churcham, Gloucester, bay gelding, **Laddie.**

II. (£5.)—T. M. AND W. DAVIES, Highfield, Llanelly, dark bay mare, **Stepney Queen,** 7 years.

III. (£2.)—T. AND W. SINGER, High House, Corsley, Warminster, **Another Delight.**

R.—MRS. J. P. GLENCROSS, Garth House, Weston-super-Mare, bay gelding, **Ormond Boy.**

CLASS 49.—*Mare or Gelding,* 15.3 *hands and over, jumping over the course in the best form on the second day of Show.* [9 entries.]

I. (£10.)—W. TRAIL, Aberdeen Riding Academy, Fountainhall Road, Queen's Cross, Aberdeen, bay gelding, **White Hope.**

II. (£5.)—J. P. GLENCROSS, Garth House, Weston-super-Mare, bay gelding, **Micky.**

III. (£2.)—A. MERRETT, Southgate Street, Gloucester.

R.—D. F. LEWES, Llysnewydd, Heullan, Card., brown gelding, **Two Step.**

CLASS 50.—*Mare or Gelding, under* 15.3 *hands jumping over the course in the best form on the second day of Show.* [11 entries.]

I. (£10.)—T. GLENCROSS, The Loose Box, Weston-super-Mare, bay mare, **Blink Bonny.**

II. (£5.)—MRS. J. P. GLENCROSS, Garth House, Weston-super-Mare, bay gelding, **Ormond Boy.**

III. (£2.)—T. M. AND W. DAVIES, Highfield, Llanelly, dark bay mare, **Stepney Queen,** 7 years.

R.—T. GLENCROSS, The Loose Box, Weston-super-Mare, bay gelding, **Tradesman.**

CLASS 51.—*Mare or Gelding,* 15 *hands and over, jumping over the course in the best form on the third day of Show.* [15 entries.]

I. (£10.)—T. GLENCROSS, The Loose Box, Weston-super-Mare, bay gelding, **Tradesman.**

II. (£5.)—T. AND W. SINGER, High House, Corsley, Warminster, **Springbok.**

III. (£2.)—T. AND W. SINGER, **Compton Bassett.**

R.—A. MERRETT, Southgate Street, Gloucester.

CLASS 52.—*Mare or Gelding, under* 15 *hands, jumping over the course in the best form on the third day of Show.* [6 entries.]

I. (£10.)—T. M. AND W. DAVIES, Highfield, Llanelly, dark bay mare, **Stepney Queen,** 7 years.

II. (£5.)—T. AND W. SINGER, High House, Corsley, Warminster, **Another Delight.**

III. (£2.)—S. PHELPS, Churcham, Gloucester, bay gelding, **Laddie.**

R.—MRS. J. P. GLENCROSS, Garth House, Weston-super-Mare, bay gelding, **Ormond Boy.**

CLASS 53.—*Mare or Gelding, jumping highest on the third day of Show.* [11 entries.]

I. (Equal) (£4 5s.)—T. AND W. SINGER, High House, Corsley, Warminster, **Compton Bassett.**

I. (Equal) (£4 5s.)—S. PHELPS, Churcham, Gloucester, bay gelding, **Laddie.**

I. (Equal) (£4 5s.)—A. MERRETT, Southgate Street, Gloucester.

I. (Equal) (£4 5s.)—T. GLENCROSS, The Loose Box, Weston-super-Mare, bay gelding, **Blue Baron.**

CLASS 54.—*Mare or Gelding, any height, jumping over the course in the best form on the fourth day of Show.* [18 entries.]

I. (£10.)—A. MERRETT, Southgate Street, Gloucester.

II. (£5.)—W. TRAIL, Aberdeen Riding Academy, Fountainhall Road, Queen's Cross, Aberdeen, bay gelding, **White Hope.**

III. (£2.)—T. GLENCROSS, The Loose Box, Weston-super-Mare, bay gelding, **Tradesman.**

R.—T. GLENCROSS, bay mare, **Blink Bonny.**

CLASS 55.—*Mare or Gelding, any height, jumping over the course in the best form on the fourth day of Show.* [5 entries.]

I. (£5.)—A. H. JONES, M.R.C.V.S., 38, Upper Thomas Street, Merthyr Tydvil, Glam., brown gelding, **Little John.**

II. (£3.)—A. H. JONES, M.R.C.V.S., bay mare, **Secret Sign.**

CONSOLATION CLASS.

CLASS 56.—*Mare or Gelding, that had competed in Classes* 47 *to* 55, *and had not won Prizes to the value of* £5, *jumping over the course in the best form on the fifth day of Show.*

I. (**£7.**)—A. MERRETT, Southgate Street, Gloucester.

II. (**£3.**)—T. GLENCROSS, The Loose Box, Weston-super-Mare.

R.—T. GLENCROSS.

CHAMPION CLASS.

CLASS 57.—*Mare or Gelding, any height, having won a Prize in Classes* 47 *to* 55 *jumping over the course in the best form on the fifth day of Show.*

I. (**£20.**)—T. GLENCROSS, The Loose Box, Weston-super-Mare, bay gelding, **Tradesman.**

MUSICAL CHAIRS.

(The Prizes in Classes 58 and 60 were given by the Swansea and District Licensed Victuallers' Association, and in Classes 59, 61 and 62 by the Swansea Local Committee).

CLASS 58.—*On the first day of Show.*

I. (**£5.**)—C. T. JONES, 202, Newport Road, Cardiff.

CLASS 59.—*On the third day of Show.*

I. (**£5.**)—C. T. JONES, 202, Newport Road, Cardiff.

CLASS 60.—*On the fifth day of Show.*

I. (**£5.**)— H. MORRIS, Kittle, Bishopston, near Swansea.

POLO BALL COMPETITION.

(For Ponies not exceeding 14.2 hands).

CLASS 61.—*On the second day of Show.*

I. (**£5.**)—C. T. JONES, 202, Newport Road, Cardiff.

CLASS 62.—*On the fourth day of Show.*

I. (**£5.**)—E. JONES, Manoravon, Llandilo.

CATTLE.

DEVON.

(£10 towards the prizes in Classes 63 to 69 was given by the Devon Cattle Breeders' Society.)

Class 63.—*Devon Cow, in-Milk, calved before* 1911. [2 entries.]

I. (£10.)—Mrs. A. C. Skinner and Son, Pound, Bishops Lydeard, **Ruby 23rd** (22628), born 8th September, 1907, bred by H. W. Corner, Inglescombe, Bath; s Noble Boy (4832), d Ruby 21st, s d Lord Breach (3467).

II. (Silver Medal.)—C. Morris, Highfield Hall, St. Albans, Herts, **May Blossom 6th** (24268), born 28th November, 1910, bred by A. D. Gill, Great Hele Barton, South Molton, Devon; s Stockleigh Hardy Boy (6914), d May Blossom 4th (22692), s d Clampit Candidate (5723).

Class 64.—*Devon Heifer, in-Milk, calved in* 1911.—[2 entries.]

I. (£10.)—Viscount Portman, Bryanston, Blandford, Dorset, **Careless**, born 15th January, bred by the late Hon. E. W. B. Portman, Hestercombe, Taunton; s Filleigh Gay Boy (6364), d Hestercombe Contessa (22955), s d Cæsar (5174).

II. (Silver Medal.)—E. Clatworthy, Cutsey, Trull, Taunton, **Primrose 5th** (C. 176), born March, bred by F. Farmer, Middleford Farm, Wellington: s Tommy Burns (6567), d Primrose 1st, s d Clampit Chieftain (4935).

Class 65.—*Devon Heifer, calved in* 1912. [6 entries.]

I. (£10.)—L. H. Alford, Horridge, Ashford, North Devon, **Horridge Belle** (25520), born 25th February; s Hall Curly Boy (6732), d Suffragette (22480), s d Capton Sunny Jim (5192).

II. (£5.)—C. Morris, Highfield Hall, St. Albans, Herts, **Highfield Charmer** (26055), born 10th April; s Holcombe Rufus (7149), d Whimple Beauty 3rd (19570), s d Hestercombe Redlight (4417).

III. (£2.)—E. Clatworthy, Cutsey, Trull, Taunton, **Cutsey Bella**, born 11th January; s Roadwater Prince (6534), d Brassey 5th (18720), s d Duke of Thoverton (4388).

R.—Sir G. A. H. Wills, Bart., Northmoor, Dulverton, **Northmoor Topsy**, born 4th February; s Overton Monarch (6849), d Tottie (21136).

H.C.—Viscount Portman, Bryanston, Blandford, **Bryanston Maud**, born 25th April; s Bryanston Amber (6271), d Bryanston Muriel (22302), s d Afterthought (3375).—Viscount Portman, **Bryanston Gold**, born 7th July; s Hestercombe Dasher (7113), d Bryanston Goblet (23815), s d Bryanston Pitcher (5980).

CLASS 66.—*Devon Heifer, calved in* 1913. [6 entries.]

I. (**£10.**)—C. MORRIS, Highfield Hall, St. Albans, Herts, **Highfield Countess 4th** (Vol. xxxvii.), born 4th January: s Capton Bellringer (4911), d Highfield Countess 2nd (23719), s d Pound Bellringer (5617).

II. (**£5.**)—SIR G. A. H. WILLS, BART., Northmoor, Dulverton, **Northmoor Prudence,** born 10th March; s Northmoor Royal Mail (7210), d Cothelstone Proof (23511).

III. (**£2.**)—E. CLATWORTHY, Cutsey, Trull, Taunton, **Cutsey Fancy,** born 15th March: s Commander (7646), d Cutsey Frolic, s d Beckley Opal (4533).

R.—VISCOUNT PORTMAN, Bryanston, Blandford, **Bryanston Gold-dust.** born 18th March; s Bryanston Amber (6271), d Bryanston Gossamer (22975), s d Prime Minister (5981).

H.C.—VISCOUNT PORTMAN, **Bryanston Rosemary,** born 14th January: s Bryanston Pathfinder (7000), d Bryanston Rattle (24588), s d Bryanston Golden Rod (5977).—VISCOUNT PORTMAN, **Bryanston Goldfinch,** born 4th February; s Expert (7113), d Bryanston Gossip (24581), s d Bryanston Pitcher (5980).

CLASS 67.—*Devon Bull, calved in* 1910 *or* 1911. [3 entries.]

I. (**£10.**)—VISCOUNT PORTMAN, Bryanston, Blandford, **Bryanston Guardian** (6998), born 21st January, 1910; s Bryanston Golden Rod (5977), d Gladys, s d Eureka (4189).

II. (**£5.**)—VISCOUNT PORTMAN, **Marmion,** born 23rd March, 1911, bred by the late Hon. E. W. B. Portman, Hestercombe, Taunton; s Stockleigh Masterpiece (6548), d Hestercombe Pink (2268), s d Pound Pink 'Un (5350).

CLASS 68.—*Devon Bull, calved in* 1912. [5 entries.]

I. (**£10.**)—SIR G. A. H. WILLS, BART., Northmoor, Dulverton, **Northmoor Vanguard,** born 13th February; s War Cry (6940), d Cothelstone Proof (23511).

II. (**£5.**)—W. E. MALLETT, Rainbow Wood, Bath, **Pound Cowboy** (7827), born 11th January, bred by — Skinner, Bishops Lydeard, Somerset; s Lord Bobs (7179), d Pound Cowslip 6th (23865), s d Pound Gladiator (6169).

III. (**Bronze Medal**).—VISCOUNT PORTMAN, Bryanston, Blandford, **Bryanston Boxer,** born 4th January; s Bryanston Pheasant (6635), d Bryanston Goodwill (23816), s d Ajax (5974).

R.—VISCOUNT PORTMAN, **Bryanston Birch,** born 28th February; s Bryanston Golden Rod (5977), d Compton Diligent (22986), s d Overton Eclipse (5078).

CLASS 69.—*Devon Bull, calved in* 1913. [9 entries.]

I. (**£10.**)—LORD POLTIMORE, Court Hall, North Molton, North Devon, **Gotten Prince 2nd** (Vol. xxxvii.), born 23rd January, 1913, bred by J. Thorne, Gotten, West Monkton, Taunton; s Blackguard (6622), d Princess 1st (C. 26), s d Pound Lord Brassey 2nd (4651).

II. (£5.)—C. Morris, Highfield Hall, St. Albans, Herts, **Highfield Conqueror** (Vol. xxxvii.), born 23rd January; s Nadrid Conqueror (7470), Highfield Favourite (24483), s d Pound Lord Brassey 5th (5622).

III. (£2.)—Lord Poltimore, **Stockleigh Nominator** (Vol. xxxvii.), born 24th February, 1913, bred by W. Tuckett, Stockleigh Pomeroy, Crediton, Devon; s General Buller (4592), d Milkmaid (23150), s d Capton Harold (4728).

R.—Mrs. A. C. Skinner and Son, Pound, Bishops Lydeard, **Pound Cowboy 2nd,** born 28th February; s Lord Bobs (7179), d Pound Cowslip 6th, s d Pound Gladiator.

H.C.—W. E. Mallett, Rainbow Wood, Bath, **Rainbow Warleigh,** born 14th January; s Ruby King (7264), d Nancy 8th (20919), s d Sir Alexander (4670).

SOUTH DEVON.

Class 70.—*Cow or Heifer, in-milk, calved in or before* 1911. [5 entries.]

I. (£10) and Specials † and ‡ —D. Camp and Sons, Widland, Modbury, South Devon, **Orange Girl** (9775), born 1st March, 1910; s Henry 8th (3179), d Widland Sunbeam 3rd (7606), s d Happy Harry (2632).

II. (£5) and **R.** for Special ‡—W. and H. Whitley, Primley Farm, Paignton **Princess 3rd** (6752), born 28th November, 1905, bred by J. Skinner, Tidwell, Staverton; s Big Ben (1593), d Princess (3891), s d Masher (769).

III. (**Bronze Medal.**)—B. Butland, Leigham, Plympton, South Devon, **Handsome 10th** (10570), born 12th May, 1911; s Henry 7th (3178), d Handsome 6th (8301), s d Lo-Ben (2167).

R.—Page and Whitley, Warren Hall, Broughton, near Chester, **Princess 4th** (8708), born 16th February, 1908, bred by J. E. Skinner, Tidwell, Staverton, Ashburton; s Sunshine (2514), d Princess 2nd (5602), s d Big Ben (1593).

Class 71.—*South Devon Heifer, calved in* 1912. [5 entries.]

I. (£10) and **R.** for Special†—B. Butland, Leigham, Plympton, South Devon, **Handsome 12th** (11361), born 4th January; s Henry 7th (3178), d Handsome 3rd (6392), s d Leigham Champion (1667),

II. (£5.)—Page and Whitley, Warren Hall, Broughton, near Chester, **Cherry Ripe** (11364), born 15th February, bred by D. Camp, Widland, Modbury, South Devon; s Ley Marquis (2941), d Widland Sunbeam, 3rd (7606), s d Happy Harry (2632).

III. (**Bronze Medal.**)—B. Luscombe, Bowden, Yealmpton, **Countess Girl** (11730 H.B.), born 31st March; s Leigham Sort (3198), d Countess (6010), s d Masher (769).

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† Given by the South Devon Herd Book Society, a Silver Medal for the best Exhibit in Classes 70 to 72.

‡ Given by Charles A. Hanson, Esq., Fowey Hall, Cornwall, Alderman of the City of London, a Challenge Cup for the best Cow in Milk, in the South Devon Classes to be won three times in succession or four times altogether, before becoming the property of the winner.

CLASS 72.—*South Devon Heifer, calved in* 1913. [6 entries.]

I. (**£10.**)—D. CAMP AND SONS, Widland, Modbury, South Devon, **Orange Girl 2nd,** born 15th January; s Ley Marquis (2941), d Orange Girl (9775), s d Henry 8th (3179).

II. (**£5.**)—B. BUTLAND, Leigham, Plympton, South Devon, **Leigham Lassie 4th,** born 8th April; s Henry 7th (3178), d Leigham Lassie 3rd (8968), s d Good Sort (2378).

III. (**£2.**)—W. AND H. WHITLEY, Primley Farm, Paignton, **Primley Gladys** (Vol. xiv.), born 6th January; s Manager (2173), d Primley Dairymaid (10469), s d Reindeer (2213).

R.—B. BUTLAND, **Snowdrop 8th,** born 8th May; s Barrister (3964), d Snowdrop 6th (8973), s d Woodford Boy (2803).

H.C.—B. BUTLAND, **Beauty 22nd,** born 1st June; s Barrister (3964), d Beauty 16th (8298), s d Lo-Ben (2167).

C.—W. AND H. WHITLEY, **Primley Gwendoline** (Vol. xvi.), born 14th February; s Primley Baron (3259), d Primley Countess (9653), s d What I Wanted. (1388).

CLASS 73.—*South Devon Bull, calved in* 1910 *or* 1911. [1 entry.]

I. (**£10**) and Special†—W. AND H. WHITLEY, Primley Farm, Paignton, **Primley Excelsior** (4153), born 2nd April, 1911; s What I Wanted (1388), d Coquette (6374), s d Babland Boy (1793).

CLASS 74.—*South Devon Bull, calved in* 1912. [3 entries.]

I. (**£10**) and **R.** for Special†—B. LUSCOMBE, Bowden, Yealmpton, **Langston King** (4434 H.B.), born 5th April; s Leigham Sort (3198 H.B.), d Wonwell Cherry 4th (7840).

II. (**£5.**)—T. WILLING, Bulleigh Barton, Ipplepen, Pamflete, South Devon, **Perfection 2nd** (4514), born 23rd March, bred by J. Harvey, Pamflete, near Yealmpton; s Kingston Boy (3193), d Myrtle (7120), s d Odd Character (1708).

CLASS 75.—*South Devon Bull, calved in* 1913. [6 entries.]

I. (**£10.**)—A. ROGERS, Brownstone, Yealmpton, **Brownstone Laddie,** born 4th January; s Pastime (3837), d Pimpernel (6364), s d Marmaduke.

II. (**£5.**)—A. ROGERS, **Wonwall Hero,** born 31st March, bred by J. Luscombe, Wonwell, Kingston, Kingsbridge; s Malston Hero 6th (3478), d Pretty Maid (6830), s d Challenger.

III. (**£2.**)—F. B. MILDMAY, M.P., Flete, Ivybridge, **Sexton Saltram,** born 3rd January; s Saltram, d Lilly, (10165), s d Henry 8th (3179).

† Given by the South Devon Herd Book Society, a Silver Medal for the best Exhibit in Classes 73 to 75.

R.—W. AND H. WHITLEY, Primley Farm, Paignton, **Primley Gainsborough** (Vol. xiv.), born 6th March, bred by Mrs. L. McMillan, Venmoor, Woodbury; s Duke 3rd (3418), d Bride (8176), s d Happy Jack (1888).

C.—B. LUSCOMBE, Bowden, Yealmpton, **Bowden King,** born 12th January; s Leigham Sort (3198), d May Girl (8524).

SHORTHORN.

(The 1st Prize in Class 76 and a Silver Medal to the Breeder of the Winner was given by the Shorthorn Society).

CLASS 76.—*Pedigree Shorthorn Dairy Cow, in-Milk, four years old and upwards on May* 28, *eligible for, and entered in Coates's Herd Book, or Pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society in* 1914, *milked in the ring before judging under Conditions* 63. [9 entries.]

I. (£10.)—C. ADEANE, Babraham Hall, Cambridge, red, **Babraham Constance,** born 24th March, 1909; s Babraham Nero (94099), d Babraham Countess Clara, s d Prince Pericles 24th (86953).

II. (£5.)—CHIVERS AND SONS, LTD., Histon, Cambridge, roan, **Melody 7th,** born 27th August, 1908, bred by the late G. Taylor, Cranford; s Missel Thrush (92564), d Melody, s d Hortsed Duke 6th (64168).

R.—C. Adeane, red, **Mischief 2nd,** born 21st June, 1907, bred by H. J. S. Tory; s Damory Gallant Victor (88340), d Damory Mischief, s d Baxter's Fancy (82333).

(The 1st Prize in Class 77 was given by the Dairy Shorthorn (Coates's Herd Book) Association).

CLASS 77.—*Pedigree Shorthorn Dairy Cow, in-Milk, under four years old on May* 28, *eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Association in* 1914, *milked in the ring before judging, under Conditions* 63 [7 entries.]

I. (£10.)—F. H. S. PERKINS, Hadnock Court, Monmouth, red, **Hadnock Ringlet 28th,** born 20th September, 1910, bred by H. F. Perkins, Wyecroft, Monmouth; s Coleshill Ranger (91287), d Hadnock Ringlet 19th, s d Scottish Beau (97045).

II. (£5.)—LORD LUCAS, Wrest Park, Ampthill, red, **Doreen,** born 27th April, 1911, bred by Lord Rothschild, Tring Park, Herts; s Foundation Stone (105524), d Dorcas, s d Conjurer (91310).

R.—C. ADEANE, Babraham Hall, Cambridge, red, **Babraham Fortune,** born 27th April, 1912; s Babraham Jewel (104602), d Freemason's Fortune, s d Salman's Freemason (100526).

H.C.—C. ADEANE, light roan, **Babraham Raindrop,** born 28th May, 1912; s Babraham Mosstrooper (104606), d Babraham Fog, s d Knight of Ivanhoe (92167).

Class 78.—*Shorthorn Cow in-Milk, calved before* 1911. [5 entries.]

I. (**£10.**)—W. M. Cazalet, Fairlawne, Tonbridge, roan, **Cairncosh Jilt,** born 28th January, 1907, bred by A. Grassick, Cairncosh, Tully'nossle, Alford; s Prince James (89670), d Jilt 42nd (Vol. lv., p. 738), s d Courier (85676).

II. (**£5.**)—R. J. Balston, Bilsington Priory, Ashford, Kent, roan, **Cumberland Orphan,** born 30th April, 1907, bred by A. J. Marshall, Bridgebank, Stranraer; s Choir Boy (91238), d Jubilee Belle (Vol. lii., p. 914), s d Scottish Victor (90068).

III. (**Bronze Medal**) and Special (**£4**) *—Miss E. C. Talbot, Penrice Castle. Reynoldston Gower, light roan, **Penrice Fairy,** born 26th September, 1909; s Golden Oriole (102377), d Leezie Lindsay 3rd, s d Bapton Sceptre.

R.—Chivers and Sons, Ltd., Histon, Cambridge, roan, **Eirwal Gwynne,** born 8th August, 1910, bred by T. D. Lawrie, Clifton. Newport Pagnall: s Village Seal (93750), d Gwynne J 8th, s d Jacobite (76910).

Class 79.—*Shorthorn Heifer in-Milk, calved in* 1911. [3 entries.]

I. (**£10.**)—T. E. Watson, Catsash, Newport, Mon., roan, **Beatrice 4th,** born 14th January; s Wanderer's Chief (80210), d Beatrice 3rd, s d Duke of Tyne (74425).

II. (**£5.**)—R. J. Balston, Bilsington Priory, Ashford, Kent, roan, **Bilsington Pink 2nd,** born 20th June; s Golden Cloud (108750), d Pluto's Pink (Vol. lvii., p. 461), s d Chiddingstone Wanderer (91224).

III. (**Bronze Medal.**)—J. A. Morrison, Basildon Park, Reading, roan, **Hampton Sweetheart,** born 29th March, bred by J. T. Hobbs, Maisey Hampton; s Duke of Hampton, d Bright Sweetheart, s d Bright Fashion.

Class 80.—*Shorthorn Heifer, calved in* 1912. [4 entries.]

I. (**£10.**)—W. M. Cazalet, Fairlawne, Tonbridge, roan, **Butterfly 64th,** born 5th April, bred by G. Watson, Old Craig, Wartle; s Lord Advocate (106009), d Butterfly 55th (Vol. liii., p. 779), s d Sir Edon (87376).

II. (**£5.**)—Chivers and Sons, Ltd., Histon, Cambridge, red and little white, **Histon Daisy,** born 30th January; s Earl of Yewden 24th (108514), d Red Daisy (Vol. lv., p. 570), s d Child of Fortune (85579).

III. (**Bronze Medal.**)—T. E. Watson, Catsash, Newport, Mon., roan, **Sateen,** born 21st August, bred by the late Viscount Tredegar, Tredegar Park, Newport, Mon.; s Pretender (103343), d Satin 2nd, s d Nansen (92642).

R. & H.C.—R. J. Balston, Bilsington Priory, Ashford, Kent, red and little white, **Dewlap 4th,** born 17th April; s Bilsington Favourite (107898), d Dewlap (Vol. lvi., p. 461), s d Tehidy Robin Hood (97420).

Class 81.—*Shorthorn Heifer, calved in* 1913. [7 entries.]

I. (**£10.**)—Chivers and Sons, Ltd., Histon, Cambridge, roan, **River Molly,** born 21st March, bred by the Duke of Portland, Welbeck Abbey; s Notlaw Phœnix (103227), d Welbeck Molly, s d Pride of the Herd (100007).

II. (**£5.**)—W. M. CAZALET, Fairlawne, Tonbridge, roan, **Augusta 114th,** born 17th January, bred by R. L. P. Duncan, Harthill, Whitehouse; s Boguhan Pride (111114), d Augusta 111th (Vol. lv., p. 539), s d Carabineer (104976).

III. (**£2.**)—R. J. BALSTON, Bilsington Priory, Ashford, Kent, red, **Blythesome 39th,** born 16th January; s Bilsington Favourite (107898), d Blythesome 36th (Vol. lix., p. 528), s d Choir Boy (91238).

R. & H.C. and Special (**£4.**)*—J. C. HARFORD, Home Farm, Falcondale, Lampeter, Cardiganshire, light roan, **Peterwell Victress 4th,** born 4th January; s Powysland Promise (Vol. lx.), d Peterwell Victress 2nd, s d Peterwell Hawthorn (106486).

C. and **R.** for Special.*—MISS E. C. TALBOT, Penrice Castle, Reynoldston, red, **Leezie 5th,** born 5th January; s New Count Lodge, d Leezie 4th, s d Penrice Gallant Victor.

CLASS 82.—*Shorthorn Bull, calved in* 1910 *or* 1911. [4 entries.]

I. (**£10**) and Champion (**£10.**)†—R. STRATTON, The Duffryn, Newport, Mon., roan, **Mischief** (112570), born 30th March, 1910, bred by Garne and Son, Aldsworth, Northleach, Glos.; s Pride of Ablington (103345), d Misfortune, s d Bapton Crown (78288).

II. (**£5**) and **R.** for Special.*—LORD DYNEVOR, Dynevor Castle, Llandilo, roan, **Adbolton Champion,** born 2nd January, 1911, bred by A. W. Hickling, Adbolton; s Duke of Hoole (98666), d Adbolton Mario's Queen (Vol. lvii., p. 810), s d King Christian of Denmark (86316).

III. (**Bronze Medal.**)—D. EVANS, Drymena Farm, Skewen, roan, **Brilliant Drymena,** born 29th July, 1911, bred by Col. J. P. Turbervill, Ewenny Priory, Bridgend, Glam.; s Brilliant Duke, d Blooming Rose 2nd, s d Pearl Archer (106472).

CLASS 83.—*Shorthorn Bull, calved in* 1912. [5 entries.]

I. (**£10**) and Special (**£4**)* and **R.** for Champion.†—SIR O. PHILIPPS, K.C.M.G., Coomb, Carmarthen, roan, **Eastwood Knight** (Vol. lx.), born 11th April, bred by J. Eccles, Myerscough House, Garstang; s Newton Crystal (92658), d Daffodil 21st (Vol. lvii., p. 746), s d Roan Vanguard (96778).

II. (**£5.**)—R. J. BALSTON, Bilsington Priory, Ashford, Kent, roan, **Bilsington Intrepid** (114337), born 9th April; s Tehidy Robin Hood (97420), d Doris 7th (Vol. lix., p. 60), s d Golden Drop Pride (83595).

III. (**£2.**)—R. M. KNOWLES, Colston Bassett Hall, Notts., white, **Cheer-up,** born 30th April, bred by W. P. Moore, Whitehall, Meelsgate, Cumberland; s Keep Smiling (105835), d Marie Christine (Vol. lvi.), s d Newton Crystal (92658).

R.—MISS E. C. TALBOT, Penrice Castle, Reynoldston, Gower, light roan, **Spade Oak Pioneer,** born 5th October, bred by Roberts Bros., Bourn End-on-Thames; s Hambleden Duke 3rd, d Norah, s d Duke of Cambalough 21st (98659).

† Given by the Shorthorn Society for the best Bull in Classes 82 to 84 entered in, or eligible for entry in, Coates's Herd Book.

CLASS 84.—*Shorthorn Bull, calved in* 1913. [4 entries.]

I. (**£10.**)—R. M. KNOWLES, Colston Bassett Hall, Notts., red, **Colston Viscount,** born 30th January; s Mex (109900), d Countess Blanche 4th (Vol. lvi.), s d Millionaire (71016).

II. (**£5.**)—R. STRATTON, The Duffryn, Newport, Mon., red, **Banner Blue,** born 11th March; s Oxford Blue (112735), d Banter, s d Ribston (100284).

III. (**Bronze Medal.**)—R. J. BALSTON, Bilsington Priory, Ashford, Kent, roan, **Bilsington Theseus,** born 25th March; s Bilsington Favourite (107898), d Rosemary 232nd (Vol. lvi., p. 902), s d Lovat Scout (99485).

HEREFORD.

CLASS 85.—*Hereford Cow, calved before* 1911. [5 entries.]

I. (**£10.**)—J. G. COOKE-HILL, Shelsley Bank, Stanford Bridge, Worcester, **Shelsley Florence,** born 11th January, 1910; s Eaton Sovereign (26832), d Florence, s d Gambler (20639).

II. (**£5.**)—W. B. TUDGE, Stepaside, Onibury, Shropshire, **Arabis,** born 22nd January, 1910, bred by J. D. D. Evans, Brecon; s Linacre (26257), d Arabella (Vol. xli., p. 376), s d Sulla (25806).

III. (**Bronze Medal**) and Special (**£4.**)*—F. F. MASON, The Faraam, Killay, Glamorgan, **Lady Love,** born 25th January, 1907, bred by H. R. Hall, jun., Ashton, Leominster; s Sultan (19760), d Lady Day, s d Ashton Lancelot (18213).

R. & H.C. and **R.** for Special.*—J. F. RICKETTS, Trebarried, Talgarth, Breconshire, **Daisy,** born 4th April, 1907, bred by D. Jones, Pytindu, Brecon; s Agamemnon (23259), d Oceana, s d Major Domo (20179).

CLASS 86.—*Hereford Heifer, in-Milk, calved in* 1911. [4 entries.]

I. (**£10.**)—A. E. HUGHES, Wintercott, Leominster, **Misty,** born 22nd January; s Ronald (26450), d Margery, s d Pearl King (24192).

II. (**£5.**)—K. W. MILNES, Stanway Manor, Church Stretton, **Gem's Ruby,** born 4th January; s Bloodstarne (27351), d Gemima (Vol. xxxi., p. 346), s d Goschen (17284).

III. (**Bronze Medal.**)—D. A. THOMAS, Llanwern Park, Newport, **Pansy 18th,** born 1st January, bred by J. Bounds, Lowe Farm, Pembridge; s Lancer (26245), d Pansy 8th (Vol. xxxv., p. 212), s d Lucifer (20172).

CLASS 87.—*Hereford Heifer, calved in* 1912. [7 entries.]

I. (**£10**) and Champion (**£10.**)†—J. G. COOKE-HILL, Shelsley Bank, Stanford Bridge, Worcester, **Miss Vera,** born 29th March, bred by W. H. Davies, Claston, Dormington, Hereford; s Nabob (26324), d Fairtrade, s d Obelisk (21637).

† Given by the Hereford Herd Book Society for the best Cow or Heifer in Classes 85 to 88.

II. (**£5.**)—K. W. Milnes, Stanway Manor, Church Stretton, **Stanway Belle,** born 24th January: s North Star (27725), d Best Love (Vol. xliii., p. 741), s d Best Man (24398).

III. (**£2.**)—D. A. Thomas, Llanwern Park, Newport, **Plume,** born 5th January; s Onsland (27741), d Plumstone (Vol. xxxix., p. 747), s d Whittern Marksman (23838).

R.—K. W. Milnes, **Gem's Radiance,** born 6th February; s Sir James (26489), d Gemima (Vol. xxxi., p. 346), s d Goschen (17284).

H.C.—W. B. Tudge, Stepaside, Onibury, Shropshire, **Sunshine Girl,** born 2nd January: s Gipsy Prince (26881), d Golden Sunshine (Vol. xl., p. 807), s d Sibdon (26760).

Class 88.—*Hereford Heifer, calved in* 1913. [10 entries.]

I. (**£10.**) and **R.** for Champion†—F. Bibby, Hardwicke Grange, Shrewsbury, **Clive Rosette,** born 1st January; s Coup d'Ore (29016), d Clive Iris 2nd (Vol. xlii., p. 276), s d Othello (24182).

II. (**£5.**)—K. W. Milnes, Stanway Manor, Church Stretton, **Stanway Gem,** born 11th January; s Sir James (26489), d Gemima 4th, s d Merryman (24158).

III. (**£2**) and Special (**£4.**)*—R. O. Rees, Braddws, Three Cocks, Brecons, R.S.O., **Miss Gordon,** born 20th January; s Gamecock (26145), d Countess (Vol. xli., p. 441), s d Royal Bage (25738).

R.—J. G. Cooke-Hill, Shelsley Bank, Stanford Bridge, Worcester, **Shelsley Mermaid,** born 2nd January; s Shelsley (26480), d Mermaid 7th, s d Waverley (25862).

V.H.C. and **R.** for Special*—F. F. Mason, The Faraam, Killay, Glamorgan, **Faraam Lilian,** born 11th February; s Marco, d Rowden Lily 16th, s d Mustutur (22397).

H.C.—D. A. Thomas, Llanwern Park, Newport, **Pansy 24th,** born 4th January, bred by J. Bounds, Lowe, Pembridge; s Baron Burcot (28016), d Pansy 8th (Vol. xxxv., p. 212), s d Lucifer (20171).

C.—W. Davies, The Cefn, Pontypridd, **Daffodil,** born 1st January; s King Character 2nd (26239), d Lemon 3rd (Vol. xxxix., p. 342), s d Hector (23493).

Class 89.—*Hereford Bull, calved in* 1910 *or* 1911. [5 entries.]

I. (**£10**) and Champion (**£10.**)‡—H. M. The King, The Royal Farms, Windsor, **Avondale** (28008), born 2nd January, 1910, bred by His Majesty the late King Edward VII., The Royal Farms, Windsor: s Admiral (23256), d Elsie, s d Lord Lieutenant (22323).

II. (**£5.**)—Sir J. R. G. Cotterell, Bart., Garnons, Hereford, **Comet,** born 12th April, 1910; s All Right (24348), d Stella (Vol. xxxix., p. 326), s d Marcellus (22353).

† Given by the Hereford Herd Book Society for the best Cow or Heifer in Classes 85 to 88.

‡ Given by the Hereford Herd Book Society for the best Bull in Classes 89 to 91.

III. (**Bronze Medal.**)—EARL OF COVENTRY, Croome Court, Worcester, **Ivington Bright,** born 19th January, 1910, bred by J. K. Hyslop, Chipps House, Ivington, Leominster; s President (26387), d Miriam 3rd (Vol. xli., p. 509), s d Harold (22201).

R.—G. BUTTERS, Hill House, Newton, Leominster, **Baronet,** born 8th January, 1911; s Dorchester (26810), d Lassie (Vol. xxxix., p. 285), s d Scot (23134).

H.C.—J. G. COOKE-HILL, Shelsley Bank, Stanford Bridge, Worcester, **Cameron,** born 12th January, 1910, bred by Captain E. L. A. Heygate, Buckland, Leominster; s Highland Prince (25437), d Ivy, s d Steelclad (17557).

CLASS 90.—*Hereford Bull, calved in* 1912. [9 entries.]

I. (**£10.**)—R. T. HINCKES, Mansel Court, Mansel Lacy, Hereford, **Sancho,** born 12th April; s Morning Glory (28510), d Sensible 3rd, s d Lucifer (20171).

II. (**£5.**)—EARL OF COVENTRY, Croome Court, Worcester, **Valet** (30162), born 25th January; s Dollymount (27500), d Valise (Vol. xliii., p. 285), s d Maxwell (24155).

III. (**£2.**)—W. B. TUDGE, Stepaside, Onibury, Shropshire, **Renown,** born 6th January, bred by G. H. Bray, Dormington; s Cornice (25253), Rubelle (Vol. xxxviii., p. 797), s d Royal Rupert (20976).

R.—C. T. PULLEY, Lower Eaton, Hereford, **Eaton Prospect** (29689), born 13th March; s Eaton Masterpiece (25315), d Loyalty 2nd, s d Eaton Defender (20602).

V.H.C.—T. L. WALKER, Ankerdine, Knightwick, Worcester, **Court Card,** born 15th January, bred by A. P. Turner, The Leen, Pembridge, Herefordshire; s Montezuma (27706), d Claribell, s d Mortimer.

H.C.—F. BIBBY, Hardwicke Grange, Shrewsbury, **Clive Count 4th,** born 30th January; s Crusader (26038), d Cherry Blossom (Vol. xliii., p. 197), s d Cherry Stone (22031).

C.—S. HAYTER, Twyford, Pembridge, Herefordshire, **Rougemont 3rd** (30041), born 18th January, bred by T. R. Thompson, Erwr Delyn, Penarth, Glam.; s Rougemont (20296), d Ladybird (Vol. xl., p. 270), s d Marmion (20844).

CLASS 91.—*Hereford Bull, calved in* 1913. [25 entries.]

I. (**£10**) and **R.** for Champion†.—G. BUTTERS, Hill House, Newton, Leominster, **Newton Albion,** born 4th January; s Baronet (28875), d Gaylass 2nd (Vol. xliv., p. 293), s d Sailor Prince (26465).

II. (**£5.**)—G. BUTTERS, **Newton Viscount,** born 23rd January; s Baronet (28875), d Lady 3rd (Vol. xliv., p. 294), s d Sailor Prince (26465).

III. (**£2.**)—DE F. PENNEFATHER, Kinnersley Castle, Eardisley, Herefordshire, **Ringleader 2nd,** born 2nd January; s Newton Edward (28523), d Ringlet (Vol. xxxv., p. 731), s d Baronet (20456).

† Given by the Hereford Herd Book Society for the best Bull in Classes 89 to 91.

Special (£4.*)—C. V. LLEWELLYN, Llysdinam, Newbridge-on-Wye, Radnorshire, **Union Jack,** born 2nd January; s Broad Ward Albion (27404), d Topsy, s d Nonpariel (19614).

R. for Special*—F. F. MASON, The Faraam, Killay, Glamorgan, **Faraam Archie,** born 26th January; s Armdale (28867), d Mimosa, s d Surprise (25810).

R.—SIR J. R. G. COTTERELL, BART., Garnons, Hereford, **Ambassador,** born 15th January; s Administrator (27298), d Ladylove (Vol. xliii., p. 278), s d Old Sort (24826).

V.H.C.—S. ROBINSON, Lynhales, Kington, **Chorister,** born 13th January; s Gainsborough (28303), d Chorus, s d Eaton Boss (21349).

H.C.—EARL OF COVENTRY, Croome Court, Worcester, **Dollar,** born 6th February; s Ivington Bright (28386), d Dolly (Vol. xl., p. 333), s d Earl Marshal (22106).—K. W. MILNES, Stanway Manor, Church Stretton, **Frigate,** born 10th March; s Sir James (26489), d Fanny (Vol. xli., p. 571), s d Marmion (20844).—K. W. MILNES, **Flying Fox,** born 25th January: s Sir James (26489), d Jessica (Vol. xxxv., p. 219), s d Glencoe (17279).

C.—R. T. HINCKES, Mansel Court, Mansel Lacy, Hereford, **Daniel,** born 21st January; s Eaton Don (27511), d Delilah, s d Lord-Lieutenant (22323).—A. E. HUGHES, Wintercott, Leominster, **Latham,** born 19th January; s Lucus (27673), d Lovekin, s d Ronald (26450).

SUSSEX.

CLASS 92.—*Cow or Heifer, in-Milk, calved in or before* 1911. [2 entries.]

I. (£10) and **R.** for Special †—J. GROVES, Browning's Manor, Blackboys, Sussex, **Somerhill Sunbeam** (10794), born 21st November, 1906, bred by O. E. d'A. Goldsmid, Somerhill, Tonbridge, Kent; s Vicar (1772), d Sultanella 12th (9705), s d Fayes 1st (1841).

II. (**Silver Medal.**)—W. T. FREMLIN, Milgate Park, Maidstone, **Milgate Rosebud,** born 7th January, 1911; s Birling Chris (2482), d Rosebud 7th (8873), s d Milgate 2nd (1688).

CLASS 93.—*Sussex Heifer, calved in* 1912 *or* 1913. [3 entries.]

I. (£10) and Special †—J. GROVES, Browning's Manor, Blackboys, Sussex, **Apsley Norah 3rd** (14203), born 20th January, 1912, bred by W. G. Fladgate, Apsley, Thakeham, Sussex; s Shillinglee Bewbush 6th (2400), d Theale Norah (9209), s d Gladsome Prince 3rd (1777).

II. (£5.)—W. T. FREMLIN, Milgate Park, Maidstone, **Milgate Blossom 2nd,** born 18th January, 1913; s Tutsham Nero (2911), d Brockhill Mayblossom 2nd (12292), s d Evegate Prince (2235).

R.—J. GROVES, **Ashburnham Bloom 2nd** (Vol. xxix.), born 26th March, 1913, bred by the Earl of Ashburnham, Battle, Sussex; s Lavington Gold 15th (2679), d Ashburnham Bloom (11647), s d Limehurst Sailor (2035).

† Given by the Sussex Herd Book Society, a Silver Medal for the best Cow or Heifer in Class 92 or 93.

Class 94.—*Sussex Bull, calved in* 1911, 1912, *or* 1913. [1 entry.]

I. (£10) and Special †—W. T. Fremlin, Milgate Park, Maidstone, **Tutsham Nero** (2911), born 3rd January, 1911, bred by G. Ward, Tutsham, West Farleigh, Maidstone; s Shillinglee Bewbush 5th (2394), d Lady Norah 5th (11592), s d Tutsham Toreador (2016).

WELSH BLACK.

(£20 of the Prizes in Classes 95 to 100 was given by the Welsh Black Cattle Society)

Class 95.—*Welsh Black Cow or Heifer, in-Milk, calved before December* 1, 1911. [3 entries.]

I. (£8.)—R. M. Greaves, Wern, Portmadoc, **Lydstep Sarah** (1487), born 2nd January, 1910, bred by Lord St. Davids, Lydstep, Haven; s Hendre Boy (256), d Sarah 5th (907).

II. (£4) and Special (£4) *—The Marquis of Bute, Cardiff Castle, **Primrose**, born 10th January, 1909, bred by J. Mathias, Kingston, Pem.; s Pembroke boy, d May Queen.

R. and **R.** for Special * —The Marquis of Bute, **Queen**, born 6th September, 1903, bred by W. H. Evans, Trenswydelfauer, Croesgoah, Letterston; s Confidence, d Madam.

Class 96.—*Welsh Black Heifer, calved on or after December* 1, 1911, *and before December*, 1, 1912. [3 entries.]

I. (£8) and Special *—D. Jenkins, Cerrigtranan, Talybont, Card., **Betsy**, born 24th December, 1911; s Billy Bach 2nd (468), d Jini Jones 2nd (296).

II. (£4) and **R.** for Special *—The Marquis of Bute, Cardiff Castle, born 21st April, 1912; s Lydstep Ruler, d Primrose, s d Pembroke Boy.

R.—R. M. Greaves, Wern, Portmadoc, **Wern Lockets** (1651), born 25th February, 1912; s Wern Joker (444), d Wern Gossip (996), s d Wern Emperor (50).

Class 97.—*Welsh Black Heifer, calved on or after December* 1, 1912, *and before December* 1, 1913. [4 entries.]

I. (£8.)—R. M. Greaves, Wern, Portmadoc, **Wern Lady** (1656), born 13th December, 1912; s Wern Imp (443), d Wern Heather (1002), s d Duke of Wellington (294).

II. (£4.)—The Marquis of Bute, Cardiff Castle, born 5th May, 1913; s Stanley, d Agnes, s d County Emperor.

† Given by the Sussex Herd Book Society, a Silver Medal for the best Bull in Class 94.

III. (**Bronze Medal.**)—C. H. LLOYD-EDWARDS, Nanhoron, Pwllheli, born 23rd December, 1912; s Robin Ddu (518), d Nanhoron Negress, (1377), s d Nanhoron Nimble (360).

R.—D. JENKINS, Cerrigtranan, Talybont, Card., born 4th December, 1912; s Namin Pasha, d Jini Jones 2nd.

CLASS 98.—*Welsh Black Bull, calved on or after December* 1, 1908, *and before December* 1, 1911. [4 entries.]

I. (**£8.**)—R. M. GREAVES, Wern, Portmadoc, **Wern Inky** (338), born 20th March, 1909; s Duke of Wellington (294), d Molteno (395).

II. (**£4**) and **R.** for Special *—THE MARQUIS OF BUTE, Cardiff Castle, **Hendre Champion,** born 20th September, 1909, bred by H. O. Ellis, Tyn-hendre, Bangor; s Hendre Cawr, d Hendre D.

III. (**Bronze Medal.**)—THE MARQUIS OF BUTE, **Stanley,** born 10th October, 1911, bred by W. Hughes, Coinant, Clynderwen: s Castle Boy, d Blackie.

R.—R. THOMAS, Castle Toch, Langharne, St. Clears, **Castle Emperor,** born 3rd August, 1911; s Wiltshire Emperor, d Kitty.

CLASS 99.—*Welsh Black Bull, calved on or after December,* 1, 1911, *and before December* 1, 1912. [5 entries.]

I. (**£8**) and Special (**£4.**)*—D. L. THOMAS, Blaensarngoch, Llanboidy, **Marquis 2nd,** born 24th December, 1911, bred by D. W. Jones, Trefawr, Llanfyrnach; s Golden Duke, d Smart (Vol. iii., 1045), s d Smarten (1043).

II. (**£4.**)—C. H. LLOYD-EDWARDS, Nanhoron, Pwllheli, **Nanhoron President,** born 4th January, 1912; s Robin Ddu (518), d Nanhoron Necklace (Vol. iv., 1374), s d Nanhoron Nimble (260).

III. (**Bronze Medal.**)—W. GRIFFITHS, Woodsend Farm, Pembroke, **The Marquis,** born 2nd December, 1911: s Lydstep Ruler (455), d Lovely (713 S.W.).

R.—D. JENKINS, Cerrigtranan. Talybont, Card., **Cadwalloa,** born 3rd December, 1911; s Billy Bach 2nd (468), d Caran Ddu 2nd (1341).

CLASS 100.—*Welsh Black Bull, calved on or after December* 1, 1912, *and before December* 1, 1913. [6 entries.]

I. (**£8.**)—C. H. LLOYD-EDWARDS, Nanhoron, Pwllheli, **Nanhoron Baronet,** born 27th December, 1912; s Robin Ddu (518), d Nanhoron Necklace (Vol. iv., 1374), s d Nanhoron Nimble (260).

II. (**£4.**)—R. ROBERTS, Rhydygarnedd, Towyn, Merioneth, **Rhydygarnedd Emperor,** born 3rd January, 1913, bred by Lord St. Davids, Lydstep, Penally; s Lydstep Emperor (515), d Lydstep Sarah (1487), s d Hendre Boy (256).

III. (**£2.**)—THE MARQUIS OF BUTE, Cardiff Castle, born 19th July, 1913; s Stanley, d Primrose, s d Pembroke Boy.

R.—R. M. GREAVES, Wern, Portmadoc, **Mahomet** (563), born 5th May, 1913; s Wern Jap (448), d Wern Icicle (1279), s d Duke of Wellington (294).

ABERDEEN-ANGUS.

(The 1st Prize in Class 101 was given by the English Aberdeen-Angus Cattle Association).

CLASS 101.—*Aberdeen-Angus Cow or Heifer, in-Milk, calved before December* 1, 1911. [3 entries.]

I. (**£10**) and Champion † and **R.** for Champion ‡—J. J. CRIDLAN, Maisemore Park, Gloucester, **Tulip of Standen** (45122), born 23rd February, 1909, bred by Captain Cookson, Chirle Standen, Wilts; s Elector of Benton (21814), d Crocus of Standen (37038), s d Elberton (20435).

II. (**£5**) and **R.** for Champion †—C. L. PRIOR, Dagnam Priory, Romford, **Fair Peggy,** born 30th January, 1909, bred by D. Arnot, Edzell Mains, N.B.; s Justice of Ardargie (25821), d Folly's Favourite (38475), s d St. Elmo of Lethan (22695).

III. (**Bronze Medal.**)—G. D. FABER, C.B., M.P., Rush Court, Wallingford, **Itala,** born 4th January, 1908, bred by J. Kennedy, Doonholm, Ayr; s Mythologist, d Idiom, s d Mailbag.

CLASS 102.—*Aberdeen-Angus Heifer, calved on or after December* 1, 1911. [3 entries.]

I. (**£10.**)—G. DRUMMOND, Swaylands, Penhurst, Kent, **Effulgent 12th of Swaylands,** born 13th December, 1911; s Wildgrave of Ballindallock (27653), d Effulgent 5th of Swaylands (43599), s d Erect of Addington (20475).

II. (**£5.**)—C. L. PRIOR, Dagnam Priory, Romford, **Persepha,** born 13th January, 1912, bred by D. M. MacRae, Stenhouse, Thornhill; s Everlasting of Ballindallock, d Persephone of Ballindallock, s d Bion.

III. (**Bronze Medal.**)—J. J. CRIDLAN, Maisemore Park, Gloucester, **Silver Pride** (51432), born 19th January, 1912, bred by Seafield Trustees, Cullen House, Cullen; s Ebliso of Dalvey (25477), d Pretty Effort (46109), s d Early Effort of Balliemore. (21778).

CLASS 103.—*Aberdeen-Angus Heifer, calved on or after December* 1, 1912. [7 entries.]

I. (**£10.**)—G. DRUMMOND, Swaylands, Penhurst, Kent, **Bluebell 2nd of Swaylands,** born 21st December, 1912; s Eboniser of Swaylands (30334), d Bluebell of Swaylands (46934), s d Gay Boy of Danesfield (21967).

II. (**£5.**)—J. J. CRIDLAN, Maisemore Park, Gloucester, **Princess of Coolcawer,** (53493), born 2nd January, 1913, bred by R. C. Williams, Macroonr, Cork; s Rudge (29959), d Jemima of Bunlick (36975), s d Viceroy of Killeadon (18640).

† Given by the English Aberdeen-Angus Cattle Association, a Silver Medal for the best Animal of opposite sex to that awarded the Gold Medal in Classes 101 to 105.

‡ Given by the Aberdeen-Angus Cattle Society, a Gold Medal, value £10, for the best Animal in Classes 101 to 105.

III. (£2.)—J. J. CRIDLAN, **Pearl of Maisemore** (52169), born 5th January, 1913; s Everwise (24436), d Peerless of Achnagonaln (45549), s d Pasha of Elchies (27255).

R. & H.C.—W. R. BOARD, Great Frampton, Llantwit Major, Cardiff, **Lilium** (52697), born 7th January, 1913, bred by J. Kennedy, Doonholm, Ayr; s Mondello (27193), d Latoma (44030), s d Mythologist (26030).

C.—C. L. PRIOR, Dognam Priory, Romford, **Daughter Peggy**, born 15th December, 1912; s Edward the Peacemaker, d Fair Peggy, s d Justice of Ardargie.

CLASS 104.—*Aberdeen-Angus Bull, calved before December* 1, 1912. [3 entries.]

I. (£10) and Champion †—J. J. CRIDLAN, Maisemore Park, Gloucester, **Everard 2nd of Maisemore**, born 3rd April, 1911; s Rubelale of Maisemore (28706), d Evergreen 13th (38736), s d Wizard of Maisemore (21465).

II. (£5.)—G. DRUMMOND, Swaylands, Penhurst, Kent, **Eric of Swaylands** (31813), born 1st February, 1911; s Wildgrave of Ballindallock (27653), d Effulgent 3rd of Danesfield (37540), s d Extractorite (15438).

CLASS 105.—*Aberdeen-Angus Bull, calved on or after December* 1, 1912. [6 entries.]

I. (£10.)—W. R. BOARD, Great Frampton, Llantwit Major, Cardiff, **Moose** (34877), born 23rd December, 1912, bred by Col. C. M'Inroy, C.B., The Burn, Edzell, N.B.; s Esineveno (30485), d Moosie (47029), s d Neligan (23580).

II. (£5.)—G. DRUMMOND, Swaylands, Penhurst, Kent, **Earl of Swaylands** (Vol. xxxviii.), born 7th January, 1913; s Prior of Swaylands (32426), d Eva of Hursley (38702), s d Evolsurus (21908).

III. (£2.)—J. J. CRIDLAN, Maisemore Park, Gloucester, **Everblack of Maisemore**, born 31st January, 1913; s Brave Briton (30218), d Evergreen 24th (46863), s d Wizard of Maisemore (21465).

R. & C.—J. J. CRIDLAN, Maisemore Park, Gloucester, **Judge of Maisemore**, born 27th December, 1912; s Estard of Maisemore (30503), d Jilt 2nd of Maisemore (46866), s d Everwise (24436).

JERSEY.

(The Prizes in Class 106 were given by the English Jersey Cattle Society).

CLASS 106.—*Jersey Cow or Heifer, in-Milk, entered in or eligible for entry in the English Jersey Herd Book, bred by Exhibitor, and sired in Great Britain or Ireland.* [8 entries.]

I. (£5.)—A. MILLER-HALLETT, Goddington, Chelsfield, Kent, whole, **Goddington Foxglove** (Vol. xix., p. 310), born 21st April, 1905; s Flying Foam (7204), d Meadow Girl (Vol. xii., p. 316), s d Prism (2383).

† Given by the Aberdeen-Angus Cattle Society, a Gold Medal, value £10, for the best Animal in Classes 101 to 105.

II. (£3.)—J. H. SMITH-BARRY, Stowell, Wilts, fawn, **Last of the Lilies**, born 2nd March, 1911; s Fleur de Lys (9583), d Lydia Languish, s d Gay Boy (7510).

III. (£2.)—J. DE KNOOP, Calveley Hall, Tarporley, whole, **Calveley Georgina** (Vol. xxiv., p. 263), born 2nd January, 1911; s Fairy's Boy, d Georgette 4th (Vol. xxi., p. 308), s d Fancy's King (3677).

R. & V.H.C.—J. H. SMITH-BARRY, brown, **Marionette**, born 4th October, 1904; s Gay Boy (7510), d Marigold, s d Sportive (7037).

C.—LADY WERNHER, Luton Hoo, Luton, whole, **Carlsbad**, born 4th December, 1907; s King Henry (8571), d Cutnow, s d Bismarck's Boy (6786). —LADY WERNHER, whole, **May Queen 2nd**, born 10th April, 1909; s Amine's Lad (9474), d May Queen, s d King Henry (8571).

CLASS 107.—*Jersey Cow, in-Milk, calved before* 1911. [20 entries.]

I. (£10.)—LORD ROTHSCHILD, Tring Park, Tring, Herts, broken, **Coulisse 15th**, born 25th April, 1908, bred by C. Le Cuirot, Grouville, Jersey; s Morny Cannon (7598), d Coulisse 9th (10916 P.S.H.C.), s d Oxford Lad (7612).

II. (£5.)—A. MILLER-HALLETT, Goddington, Chelsfield, Kent, whole, **Beautiful Mansion** (16801 J.S.), born 18th May, 1909, bred by P. Le C. Mallett, St. Brelades, Jersey; s Boy Beauty (4068), d Jockey's Mansion (12261), s d Jockey (3358).

III. (£2.)—A. MILLER-HALLETT, Goddington, Chelsfield, Kent, whole, **Goddington Foxglove** (Vol. xix., p. 310), born 21st April, 1905; s Flying Foam (7204), d Meadow Girl (Vol. xii., p. 316), s d Prism (2383).

R. & V.H.C.—J. DE KNOOP, Calveley Hall, Tarporley, broken fawn, **Seamless** (Vol. xxi., p. 416), born 25th July, 1906, bred by E. Cabot, St. Clements; s Velveteen's Lad (3714), d Heartless (11952), s d Hearty Fox (3365).

V.H.C.—J. H. SMITH-BARRY, Stowell, Wilts, brown, **Marionette**, born 4th October, 1904; s Gay Boy (7510), d Marigold, s d Sportive (7037).—DAME E. F. SMYTH, Ashton Court, Bristol, whole, **Zanzibar's Lottie**, born 6th March, 1908, bred by W. G. Renouf, St. Martin's, Jersey; s Campanile's Sultan, d Zanzibar's Blue Belle, s d Romeo.—H. WALKER, Beach, Bitton, Glos., broken, **Stalebread 12th**, born 20th February, 1906, bred by J. Hamon, Trinity, Jersey; s Sultan of Oaklands, d Stalebread 6th, s d Flying Fox.

H.C.—J. DE KNOOP, whole light brown, **Plymouth Judy**, born 10th March, 1909, bred by P. W. Le Brocq, St. Peter's; s Plymouth Lad (3922), d Ione (8964).

CLASS 108.—*Jersey Cow or Heifer, in-Milk, calved in* 1911. [12 entries.]

I. (£10.)—J. H. SMITH-BARRY, Stowell, Wilts, fawn, **Last of the Lilies**, born 2nd March, 1911; s Fleur de Lys (9583), d Lydia Languish, s d Gay Boy (7510).

II. (£5.)—J. DE KNOOP, Calveley Hall, Tarporley, whole, **Calveley Georgina** (Vol. xxiv., p. 263), born 2nd January, 1911; s Fairy's Boy, d Georgette 4th (Vol. xxi., p. 308), s d Fancy's King (3677).

III. (£2.)—Lord Rothschild, Tring Park, Tring, Herts, whole, **Brown May** (Vol. xxv.), born 12th June, bred by F. J. Bisson, St. Lawrence, Jersey; s Juggler (10306), d Jersey Queen 3rd (15809 P.S.C.), s d Molly's Combination (10005).

R. & H.C.—J. H. Smith-Barry, fawn, **Moonstone,** born 9th July, 1911; s Redruth (10407), d Mammet, s d Golden Beam (9247).

H.C.—Lord Poltimore, Poltimore Park, Exeter, broken, **Table Dainty,** born 14th March, 1911, bred by J. du Feu, St. Lawrence; s Lucy's Prince (3939), d Delicious (8276), s d Golden Hero (1833).

C.—Lord Rothschild, broken, **White Pansy,** born 12th June, bred by J. B. Badier, St. Martin's, Jersey; s Noble's Jolly Sultan (10022), d Montonne (15001 P.S.C.), s d Granny's Hero.

Class 109.—*Jersey Heifer, in-Milk, calved in or since* 1912. [13 entries.]

I. (£10.)—H. Walker, Beach, Bitton, Glos., broken, **Fairy Queen Fern,** born 22nd March, bred by the Asylum Committee, St. Saviour's, Jersey; s Golden Fern's Noble, d Fairy 3rd, s d Forfarshire.

II. (£5.)—Lord Poltimore, Poltimore Park, Exeter, whole, **Pixie** (Vol. xxiv., p. 98), born 26th April, 1912: s Likely Lad (10330), d Poppy (Vol. xxiii., p. 389), s d Trojan (9803).

III. (£2.)—A. Miller-Hallett, Goddington, Chelsfield, Kent, whole, **Indispensable 2nd,** born 11th January, bred by C. W. Journeaux, St. Martin's, Jersey; s Golden Fern's Noble (4570), d Indispensable (14275), s d Vandyke (3866).

R. & V.H.C.—Lady Wernher, Luton Hoo, Luton, whole, **May Queen 4th**; s China's Fairy Boy (9869), d May Queen, s d King Henry (8571).

Class 110.—*Jersey Heifer, calved in* 1913. [14 entries.]

I. (£10.)—Mrs. C. M. McIntosh, Havering Park, Romford, whole, **Golden Belle,** born 1st June; s Golden Beam (9247), d Tapon's Blue Belle (Vol. xvii., p. 414).

II. (£5.)—Lord Rothschild, Tring Park, Tring, Herts, whole, **Dorothy,** born 29th September; s Cannon Grey (Vol. xxv.), d Dan's Sally (Vol. xxv.), s d Dan Patch (Vol. xxv.).

III. (£2.)—A. Miller-Hallett, Goddington, Chelsfield, Kent, whole, **Goddington Lady Aldam,** born 28th May; s Self Acting (11147), d Lady Aldan 17th (Vol. xxiv., p. 340), s d Noble of Oaklands (3909).

R. & V.H.C.—Lady Wernher, Luton Hoo, Luton, whole, **Exempt 2nd,** born 30th May; s Ebonist Noble, d Exempt, s d Rover (4368).

V.H.C.—Lord Rothschild, whole, **Welcome** (reg. Vol. xxv.), born 17th July, 1913; s Raleigh's Chief (11121), d Watkin's Plymouth Lady (Vol. xxiv., p. 442), s d Plymouth Lad (9388).—Dame E. F. Smyth, Ashton Court, Bristol, whole, **Cherry Ripe,** born 12th January, bred by H. B. Napier, Long Ashton; s Pearl's Noble, d Cerise, s d Halberton's Bob.

H.C.—J. DE KNOOP, Calveley Hall, Tarporley, whole, **Calveley Almond,** born 21st April; s Calveley Raisin, d Calveley Maxima (Vol. xxiv., p. 263), s d Fairy's Boy.

C.—M. W. STRATFORD, Ozleworth Park, Wotton-under-Edge, Glos., light fawn, **Spearmint,** born 29th May; s Javelin (11005), d Golden Bess (Vol. xix., p. 311), s d Golden Boy (7826).

CLASS 111.—*Jersey Bull, calved in* 1910 *or* 1911. [4 entries.]

I. (£10.)—H. WALKER, Beach, Bitton, Glos., broken, **Pallas Noble,** born 14th March, 1911, bred by N. du Feu, jun., Jersey; s Noble of Oaklands, d Pallas 2nd, s d Sovereign.

II. (£5.)—DAME E. F. SMYTH, Ashton Court, Bristol, whole, **Luby** (11047), born 11th July, 1911, bred by J. Shickey, Beaford, Devon; s Rochette's Lass Boy (10414), d Lulu, s d Rubens (10080).

III. (Bronze Medal.)—BARON B. SCHRODER, The Dell, Englefield Green, Surrey, broken, **Lord Steyne,** born 15th April, 1911, bred by Viscount Enfield, Dancer's Hill, Herts; s Lord Alfriston (9314), d Speculation, s d Quicksilver (8679).

CLASS 112.—*Jersey Bull, calved in* 1912. [5 entries.]

I. (£10.)—MRS. C. M. McINTOSH, Havering Park, Romford, whole, **Goddington Noble 11th,** born 18th April, bred by A. Miller-Hallett, Goddington, Chelsfield, Kent; s Goddington Winks (10253), d Goddington Bagatelle (Vol. xx., p. 317), s d River of Oaklands (8348).

II. (£5.)—MISS ENDERBY, Beckington, Bath, brown, **Beckington Champion,** born 20th March; s Century Champion (10898), d Mourier Belle 14th.

III. (Bronze Medal.)—DAME E. F. SMYTH, Ashton Court, Bristol, whole, **Orion,** born 24th May, bred by Ph. Ahier, St. Martin's Jersey; s Golden Fern's Noble, d Oloroso, s d Leda's Golden Lad.

R.—H. WALKER, Beach, Bitton, Glos., self, **Beach Premier,** born 20th April; s Combination Premier, d Sweetbread 25th, s d Expectation Prince.

H.C.—J. DE KNOOP, Calveley Hall, Tarporley, whole, **Calveley Peer,** born 12th May; s Violette's Laddie, d Little Duchess (Vol. xxi., p. 351), s d Lucy's Champion (3731).

CLASS 113.—*Jersey Bull, calved in* 1913. [15 entries.]

I. (£10.)—A. MILLER-HALLETT, Goddington, Chelsfield, Kent, broken, **Goddington Winks 6th,** born 19th April; s Goddington Winks (10253), d Goddington Bagatelle (Vol. xx., p. 317), s d Rover of Oaklands (8348).

II. (£5.)—MRS. EVELYN, Wotton House, near Dorking, Surrey, broken, **Red Cloud,** bred by J. H. Smith-Barry, Stowell Park, Pewsey, Wilts; d Post Obit.

III. (£2.)—LORD ROTHSCHILD, Tring Park, Tring, Herts, whole, **Merlin,** born 4th May; s General Cowslip (10960), d Miss Faerie 3rd (Vol. xxv.), s d Perry Farm Stockwell (10041).

R.—MRS. C. M. MCINTOSH, Havering Park, Romford, whole, **Welcome You'll Do,** born 14th January, bred by C. Renouf, Jersey; s Oxford You'll Do (4075), d Welcome Pearl (9735), s d Pearl King (2827 H.C.).

V.H.C.—H. WALKER, Beach, Bitton, Glos., broken, **Beach Guy,** born 26th January; s Mabel's Chief, d Foxglove 6th, s d Noble of Oaklands.

H.C.—J. DE KNOOP, Calveley Hall, Tarporley, whole, **Calveley Nut,** born 12th February; s Fairy's Boy, d Calveley Belle (Vol. xxii., p. 266), s d Inspector (9284).—LORD ROTHSCHILD, whole, **Cute's Fontaine's Star,** born 31st May; s Fontaine's Star (10951), d Cute 2nd (Vol. xxii., p. 278), s d Clio (7142).

C.—LORD POLTIMORE, Poltimore Park, Exeter, whole, **Royal Castle,** born 18th March, bred by C. H. Le Cornu, St. Lawrence; s Benedictine's Nobleman (4857), d Rose's Molly (16634), s d Molly's Raleigh (4258).—LADY WERNHER, Luton Hoo, Luton, whole, **Fairy Boy,** born 10th February; s China's Fairy Boy (9869), d Carlsbad, s d King Henry (8571).

GUERNSEY.

(£10 towards the Prizes in the Guernsey Classes was given by the English Guernsey Cattle Society).

CLASS 114.—*Guernsey Cow, in-Milk, calved before* 1911. [5 entries.]

I. (£10.)—SIR E. A. HAMBRO, K.C.V.O., Hayes Place, Hayes, Kent, fawn, **Rose des Houards** (50), born 7th September, 1909, bred by P. Bosanquet, Pontfield, Hertford; s Champion of the Bourg (1808), d Rose des Houards 43rd (7450).

II. (£5.)—SIR E. A. HAMBRO, K.C.V.O., red, **Hayes Express 3rd,** born 25th July, 1907; s Coronation King (1556), d Hayes Express (5828).

III. (Bronze Medal.)—A. W. B. HAWKINS, Stagenhoe Park, Welwyn, Herts, fawn with white patches, **Winter Green 5th** (7515 E.G.H.B.), born 3rd January, 1907, bred by the late Right Hon. J. E. Ellis, Wrea Head, Scalby, Yorkshire; s Hayes King (1673 E.G.H.B.), d Winter Green 3rd (6392 E.G.H.B.), s d Broomflower (1446 E.G.H.B., 1247 P.S.R.G.A.S.).

R.—MRS. JERVOISE, Herriard Park, Basingtsoke, fawn and white, **Nora 8th of Les Houards** (7923 P.S., R.G.A.S.), born 16th January, 1908, bred by F. G. Heaume, Les Houards Forest, Guernsey; s Golden Hero of l'Etienne (1507 P.S., R.G.A.S.), d Nora of Les Houards (2071 F.S., R.G.A.S.).

H.C.—J. F. REMNANT, M.P., The Grange, Twyford, Berks, fawn and white, **Treacle 3rd,** born 14th January, 1909, bred by J. H. Boner, Dursley, Gloucestershire; s King's Cup (1850), d Sweetsome 2nd (6014).

CLASS 115.—*Guernsey Heifer, in-Milk, calved in* 1911. [5 entries.]

I. (£10.)—G. F. FERRAND, Morland Hall, Alton, Hants, fawn and white, **Morland May Queen** (10215), born 7th November, bred by J. Sebire, Tamworth, Alderney; s Prince (58 P.S., R.A.A.S.), d Nelly (384 F.S., R.A.A.S.).

II. (**£5.**)—A. W. B. HAWKINS, Stagenhoe Park, Welwyn, Herts, fawn and white, **Merton Dairymaid 5th** (9098 E.G.H.B.), born 1st August, bred by W. F. Empson, Merton Grange, Gamlingay, Cambridgeshire; s Merton Village Boy (1971 E.G.H.B.), d Merton Dairy Maid 4th (8178 E.G.H.B.), s d Merton Governor of the Gron (2064 E.G.H.B.).

III. (**Bronze Medal.**)—MRS. W. H. PALMER, Murrell Hill, Binfield, red, **Hayes Loyal 5th,** born 28th April, bred by Sir E. A. Hambro, Hayes Place, Hayes, Kent; s Gay Boy (2020), d Hayes Loyal 3rd (7674).

R.—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, South Devon, lemon fawn, **Elfordleigh Patty,** born 18th April; s Elfordleigh Linden's Sequel, d Elfordleigh Peeress.

H.C.—MRS. W. H. PALMER, fawn and white, **Ashburnham Slavey,** born 15th October, bred by the Earl of Ashburnham, Ashburnham Place, Battle, Sussex; s Noble of La Ruette (2344), d Ashburnham Mab (6407).

CLASS 116.—*Guernsey Heifer, calved in* 1912. [5 entries.]

I. (**£10.**)—H. F. PLUMPTRE, Goodnestone Park, Canterbury, fawn and white, **Butterwort 9th** (9342), born 25th April; s Fleur-de-Lys 4th (2135), d Butterwort 8th (8383), s d Moss Raider (1871).

II. (**£5.**)—J. F. REMNANT, M.P., The Grange, Twyford, Berks, fawn and white, **Romana** (49), born 15th February, bred by S. Thomas, Stanstead, Bury, Ware, Herts; s Lennard 2nd (2162), d Romana 26th (6684).

III. (**Bronze Medal.**)—MRS. JERVOISE, Herriard Park, Basingstoke, fawn and white, **Sarkey's Violet** (11906 P.S., R.G.A.S.), born 22nd July, bred by N. Roberts, Gories, St. Andrew's, Guernsey; s Raymond's Pearl (2560 P.S., R.G.A.S.), d Sark Violet (4369 P.S., R.G.A.S.).

R.—MISS M. BAILLIE, Hamilton, Burley Lodge, Ringwood, Hants, fawn and white, **Early Morn 8th,** born 15th May; s Bonnie's Pride 2nd (2122 E.G.H.B.), d Early Morn 6th (6859 E.G.H.B.), s d Deputy of the Quartiers (1559 E.G.H.B.).

C.—MRS. JERVOISE, red and white, **Golden Rose 2nd of the Briquet** (11623 P.S., R.G.A.S.), born 25th April, bred by J. Le Page, Le Briquet, St. Saviour's, Guernsey; s Billy France 2nd (late Froome's Archer) (2194 P.S., R.G.A.S.), d Rose of the Pipeterie (3398 F.S., R.G.A.S.).

CLASS 117.—*Guernsey Heifer, calved in* 1913. [13 entries.]

I. (**£10.**)—SIR E. A. HAMBRO, K.C.V.O., Hayes Place, Hayes, Kent, **Hayes Felois 10th,** born 25th August; s Hayes Cherub 2nd, d Hayes Felois 4th.

II. (**£5.**)—G. F. FERRAND, Morland Hall, Alton, Hants, fawn, **Morland Cornelian** (10212), born 17th July; s Chieftain of Hawkley (2238), d Rushington Shamrock 3rd (8243), s d Bonnie's Pride (1803).

III. (**£2.**)—MRS. JERVOISE, Herriard Park, Basingstoke, fawn and white, **Lady Digby 3rd** (12872 R.G.A.S.), born 17th June, bred by G. H. Froome, School Lane Farm, Guernsey; s Flora's Sequel 2nd of Vimera (2921 P.S., R.G.A.S.), d Long Frie Daisy 3rd (7344 P.S., R.G.A.S.).

R.—H. F. PLUMPTRE, Goodnestone Park, Canterbury, fawn and white, **May of Goodnestone** (Vol. xxx.), born 8th March; s Royal Sequel (2511), d Ashburnham May (7532), s d Charmont of the Gron (1809).

V.H.C.—A. W. B. HAWKINS, Stagenhoe Park, Welwyn, Herts, light red and white, **Stagenhoe Daisy of La Hougue 2nd,** born 7th April, bred by N. F. Heaume, La Hougue, Pale, Guernsey; s Okay (2431 P.S., R.G.A.S.), d Daisy of the Camp (5829 P.S., R.G.A.S.).—J. F. REMNANT, M.P., The Grange, Hare Hatch, Twyford, Berks., fawn and white, **Dene Preel 3rd,** born 20th May, bred by W. J. Empson, Merton Hall, Romford, Essex; s Don of Warren Wood, d Merton Pansey of the Preel.

H.C.—MISS BAILLIE HAMILTON, Burley Lodge, Ringwood, Hants, fawn and white, **Lolaya,** born 14th January; s Loyalty 2nd (2332 E.G.H.B.), d Lonesome 4th (7744 E.G.H.B.), s d Carthage 2nd (1737 E.G.H.B.).—MRS. W. H. PALMER, Murrell Hill, Binfield, fawn and white, **Murrell Rose,** born 20th June; s Hayes Prime Minister (2298), d Hartfield Rose Le Conteur 4th (8092).

C.—MRS. W. H. PALMER, red and white, **Murrell Venus,** born 28th May; s Hayes Prime Minister (2298), d Hartfield Venus (8538).

CLASS 118.—*Guernsey Bull, calved in* 1910 *or* 1911. [6 entries.]

I. (£10.)—F. P. BARLOW, Lynchmere House, Haslemere, fawn and white, **Roberts Boy's Sequel** (2496), born 21st March, 1911, bred by J. Le Page, Velloeg Farm, Castel, Guernsey; s Roberts Boy (2275 P.S., R.G.A.S.), d Flossie of the Natliaux (2461 P.S., R.G.A.S.).

II. (£5.)—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, orange, fawn and white, **Raymond's Joe** (2362), born 30th April, 1910, bred by J. Le Page, Neuve Maison, Castel, Guernsey; s Raymond of the Preel 4th (late Mike) (1911 P.S., R.G.A.S.), d Bon Espoir 9th (4545 P.S., R.G.A.S.).

III. (£2.)—SIR E. A. HAMBRO, K.C.V.O., Hayes Place, Hayes, Kent, fawn and white, **Langley Gay Boy,** born 2nd April, 1911, bred by J. L. Bucknall, Langley Court, Beckenham; s Merton Sir William, d Itchen Lady May.

R.—MRS. JERVOISE, Herriard Park, Basingstoke, orange and white, **Trengwainton Corporal** (2528), born 10th October, 1911, bred by T. R. Bolitho, Trengwainton, Cornwall; s The Major (2195), d Godolphin Ida 3rd (7652).

C.—MRS. W. H. PALMER, Murrell Hill, Binfield, red and white, **Hayes Fido** (2460), born 18th October, 1911, bred by Sir E. A. Hambro, Hayes Place, Hayes, Kent; s Hayes Fido (2146), d Hayes Rosina (8557).

CLASS 119.—*Guernsey Bull, calved in* 1912. [6 entries.]

I. (£10.)—H. F. PLUMPTRE, Goodnestone Park, Canterbury, fawn, **Golden Casket 3rd** (2586), born 25th May; s Golden Casket (2138), d Muriel 22nd (7025), s d Roland of Seaview 10th (1621).

II. (£5.)—F. P. BARLOW, Lynchmere House, Haslemere, fawn and white, **Clatford Hero 3rd** (2574), born 28th April, bred by J. C. Forster, Clatford Mills, Andover; s Clatford Hero 2nd (2242), d Clatford Meadow Sweet 2nd (8401), s d Prince (58 P.S., R.A.A.S.).

III. (£2.)—J. F. REMNANT, M.P., The Grange, Twyford, Berks, fawn and white, **Dene Boy,** born 7th May, bred by J. L. Bucknall, Langley Court, Beckenham, Kent; s Honfleur of Neugrove (2308), d Itchen Lady May (5155).

R.—A. W. B. HAWKINS, Stagenhoe Park, Welwyn, Herts, fawn and white, **Stagenhoe Royal Justinee**, born 16th June, bred by T. Bretrant, La Croix, Forteval; s Justinée Sequel of the Preel (2119 P.S., R.G.A.S.), d Rougette of La Croix (3210 F.S.).

CLASS 120.—*Guernsey Bull, calved in* 1913. [10 entries.]

I. (£10.)—F. P. BARLOW, Lynchmere House, Haslemere, red and white, **Lord Roberts 2nd** (2794), born 5th July; s Roberts Boy's Sequel (2496), d Clatford Meadow Sweet (8015), s d Chieftain (62 R.A.A.S.).

II. (£5.)—G. F. FERRAND, Morland Hall, Alton, Hants, fawn, **Reliance of Morland** (2835), born 13th June, bred by A. W. Bailey Hawkins, Stagenhoe Park, Welwyn, Herts.; s Merton Reliance (2338), d Tempsford Beauty (7111), s d Merton Dairyman (1688).

III. (£2.)—J. F. REMNANT, M.P., The Grange, Twyford, Berks, fawn and white, **Dene Dandy**, born 13th March; s Honghur of Newgrove, d Lady 97, s d Goldseeker.

R.—F. P. BARLOW, lemon and white, **Clara's Pearl King** (2716), born 7th June, bred by E. P. Mahy, Maple Lodge, Vale, Guernsey: s Raymond's Pearl King (2560 P.S., R.G.A.S.), d Clara 16th of the Rouvets (5476 P.S., R.G.A.S.).

V.H.C.—SIR E. A. HAMBRO, K.C.V.O., Hayes Place, Hayes, Kent, fawn and white, **Hayes Cherub 4th,** born 4th May; s Hayes Cherub 2nd, d Wena.

H.C.—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, South Devon, orange, fawn and white, **Elfordleigh Raymond's Vic,** born 13th May; s Raymond's Joe (2362), d Elfordleigh White Violet (7509).

C.—MISS BAILIE HAMILTON, Burley Lodge, Ringwood, Hants, red, fawn and white, **Royal Blue**, born 13th May; s Royalty 7th (2373 E.G.H.B.), d Loresome 3rd (6603 E.G.H.B.), s d Burly Grace (1552 E.G.H.B.).

KERRY.

CLASS 121.—*Kerry Cow or Heifer, in-Milk, calved in or before* 1911. [3 entries.]

I. (£10.)—T. WAITE, Highlands, Redhill, Surrey, **Kilmorna Waterville 1st,** born 1900.

II. (£5.)—T. WAITE, **Gort Drops 3rd,** born 20th March, 1908, bred by D. M. Rattray, Gortnesketry, Co. Kerry; s Gort Earl (597), d Gort Drops (3311).

III. (Bronze Medal.)—L. CURRIE, Minley Manor, Farnborough, Hants, **Minley Mistress** (1253 F.S.), born 1909.

CLASS 122.—*Kerry Heifer calved in* 1912 *or* 1913. [2 entries.]

I. (£10.)—L. CURRIE, Minley Manor, Farnborough, Hants., **Minley Flo,** born 10th May, 1912; s Ard Calin Picture, d Duv Rosebud (1370), s d Duv Daniel (590).

II. (Silver Medal.)—MARQUIS OF LANSDOWNE, K.G., Bowood Park, Calne, Wilts, **Countess,** born 14th March, 1914; s Bebington Marquis, d Madge.

CLASS 123.—*Kerry Bull, calved in* 1911, 1912, *or* 1913. [3 entries.]

I. (£10) and Special †—L. CURRIE, Minley Manor, Farnborough, Hants, **Minley Lad**, born 28th June, 1912; s Minley Rover (2871), d Minley Madam (1235 F.S.).

II. (£5.)—S. ASHBY, Rivernook Farm, Wraysbury, Bucks, **Rivernook Lad** (763), born 3rd April, 1912, bred by J. Neill, The Park, Killarney, Co. Kerry; s Waterville Rover (581), d Duv Biddy (3117).

III. (Bronze Medal.)—MARQUIS OF LANSDOWNE, K.G., Bowood Park, Calne, Wilts, **Walton Ferdinand**, born 24th April, 1912, bred by Lady Greenall; Walton Hall, Warrington; s Walton Jap (272), d Walton Fenella (1500).

DEXTER.

CLASS 124.—*Dexter Cow or Heifer, in-Milk, calved in or before* 1911. [7 entries.]

I. (£10.)—MRS. E. MORANT, Brokenhurst Park, Hants, black, **Harley Coy** (1655), born 11th May, 1907, bred by G. Habgood, Harley Lodge, Wimborne; s Kingwood Comely Boy (264), d Harley Signorina (1145), s d Great Malvern (178).

II. (£5) and Special ‡—B. DE BERTODANO, Cowbridge House, Malmesbury, Wilts, red, **Cowbridge Nancy** (H.B. 1647), born 29th May, 1908; s Cowbridge Xit (H.B. 291), d La Mancha Sweet Nell (H.B. 970).

III. (£2.)—H. M. GIBBS, Barrow Court, Flax Burton, S.O., black, **Barrow Buttercup 2nd**, born 4th June, 1909; s Barrow Count (383), d Barrow Buttercup (1676).

R. & V.H.C.—REV. R. L. SIMKIN, Down Ampney Vicarage, Cricklade, red, **Oakridge Queen**, born 10th April, 1909, bred by Col. Stallard, St. John's House, Worcester; s Oakridge Rex (366), d Oakridge Dumpling (1532).

V.H.C.—HON. MRS. C. PORTMAN, Goldicote, Stratford-on-Avon, black, **Black Child**, born August, 1910.

H.C.—H. M. GIBBS, black, **Barrow Emerald 3rd**, born 13th May, 1911; s Barrow Bacchus (419), d Barrow Emerald 2nd.

† Given by B. de Bertodano, Esq., for the best Animal in Classes 121, 122 or 123, to which the Cup had not previously been awarded. The Bertodano Challenge Cup, value 25 guineas. The Cup to become the property of an Exhibitor winning it three years in succession.
The English Kerry and Dexter Cattle Society presents a Silver Medal to the owner of the winning animal on each occasion the Cup is competed for.

‡ Given by the English Kerry and Dexter Cattle Society. The Devonshire Challenge Cup, for the best Animal in Classes 124 to 127 bred by Exhibitor, and entered in or eligible for the English Kerry and Dexter Herd Book. The Cup to be won by the same Exhibitor with different animals three years in succession before becoming his absolute property.
The English Kerry and Dexter Cattle Society presents a Silver Medal to the owner of the winning animal on each occasion the Cup is competed for.

CLASS 125.—*Dexter Heifer, calved in* 1912 *or* 1913. [6 entries.]

I. (£10.)—HON. MRS. C. PORTMAN, Goldicote, Stratford-on-Avon, black, **La Mancha Honey,** born 20th April, 1912, bred by R. T. Robertson, Malahide, Co. Dublin.

II. (£5.)—H. MARTIN GIBBS, Barrow Court, Flax Bourton, S.O., red, **Barrow Buttercup 5th,** born 2nd June, 1912; s Barrow Bacchus (419), d Barrow Buttercup 2nd (1728), s d Barrow Count (383).

III. (£2.)—H. MARTIN GIBBS, black, **Barrow Lucy 2nd,** born 23rd April, 1912; s Harley Chieftain (433), d Barrow Lucy (1837).

CLASS 126.—*Dexter Bull, calved in* 1911, 1912 *or* 1913. [5 entries.]

I. (£10.)—MRS. E. MORANT, Brokenhurst Park, Hants, black, **Spalpeen** (515), born 15th July, 1912, bred by Baron Dimsdale, Musden Manor, Buntingford, Herts; s Cloister (463), d Musden Sweet Briar (1947), s d Compton Don (426).

II. (£5.)—B. DE BERTODANO, Cowbridge House, Malmesbury, Wilts, black, **Cowbridge Prince** (Vol. xiv.), born 1912.

III. (£2.)—HON. MRS. C. PORTMAN, Goldicote, Stratford-on-Avon, black, **La Mancha Little Tich,** born April, 1912.

R.—HON. MRS. C. PORTMAN, red, **Goldicote Perfection,** born 13th March, 1913; s Shamrock (493), d La Mancha Hard to Find (1238), s d La Mancha What Next (279).

(The Prizes in Class 127 were given by the English Kerry and Dexter Cattle Society).

CLASS 127.—*Dexter Bull, calved in* 1913, *whose sire and dam were entered in the English Kerry and Dexter or Royal Dublin Society's Herd Book.* [5 entries.]

I. (£10.)—HON. MRS. C. PORTMAN, Goldicote, Stratford-on-Avon, red, **Goldicote Perfection,** born 13th March, 1913; s Shamrock (493), d La Mancha Hard to Find (1238), s d La Mancha What Next (279).

II. (£3.)—B. DE BERTODANO, Cowbridge House, Malmesbury, Wilts, red, **Cowbridge Dainty Boy** (Vol. xiv.), born 1st May; s Cowbridge Hero (H.B. 654), d Cowbridge Dainty Maid (H.B. (1643), s d Cowbridge Xit (H.B. 291).

III. (£2.)—B. DE BERTODANO, black, **Cowbridge Nero** (Vol. xiv.), born 4th June; s Cowbridge Hero (H.B. 465), d Cowbridge Coquette 2nd (H.B. 1867), s d Cowbridge Snowboy (H.B. 404).

R.—H. M. GIBBS, Barrow Court, Flax Bourton, S.O., black, **Barrow Adam,** born 11th November; s Barrow Bacchus (419), d Barrow Eve (1427).

DAIRY.

CLASS 128.—*Cow, in-Milk, of any breed or cross, under* 950 *lbs. live weight, yielding the largest quantity of milk, of normal character, containing at each time of milking* 12 *per cent. of total solids, of which not less than* 3 *per cent. shall be fat, the period of lactation being taken into consideration.* [8 entries.]

I. (£10.)—J. H. SMITH-BARRY, Stowell Park, Pewsey, Wilts, brown Jersey. **Musette,** born 30th July, 1909; s Fleur de Lys (9583), d Marigold, s d Sportive (7037). (Last calf March 17, 1914).

II. (£5.)—MISS ENDERBY, Beckington, Bath, brown Jersey, **Favour's Fortune,** born 8th May, 1908, bred by the late J. W. Steeds, New Close Farm, Frome, Somerset; s Black Bob (9149), d Favour's Flower (Vol. xvii., p. 293), s d Flower's Hero (8515).

III. (£2.)—LADY WERNHER, Luton Hoo, Luton, whole Jersey, **Carlsbad,** born 4th December, 1907; s King Henry (8571), d Cutnow, s d Bismarck's Boy (6786). (Last calf April 3, 1914).

R.—J. H. SMITH-BARRY, lemon and white Jersey, **Foxglove,** born 1st September, 1910; s Silver Fox (10097), d Flower Girl, s d Oxford Sunbeam (8650). (Last calf January 15, 1914).

CLASS 129.—*Cow, in-Milk, of any breed or cross,* 950 *lbs. live weight or over, yielding the largest quantity of milk of normal character, containing at each time of milking* 12 *per cent. of total solids, of which not less than* 3 *per cent. shall be fat, the period of lactation being taken into consideration.* [8 entries.]

I. (£10.)—J. EVENS, Burton, near Lincoln, Lincoln Red Shorthorn, **Burton Bella,** 5 years old, bred by — Barber; s England's King (78818 C.H.B.). (Last calf March 23, 1914).

II. (£5.)—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, South Devon, Guernsey, **Cherry,** age about 10 years, bred by — Laity, Cornwall; s Rosy Boy. (Last calf April 6, 1914).

III. (£2.)—J. H. SMITH-BARRY, Stowell Park, Pewsey, Wilts, Jersey, **Flower Girl,** born 28th June, 1909; s Oxford Sunbeam (8650), d Lily, s d Dryden (8158). (Last calf January 16, 1914).

R.—G. W. STARK, Forge Farm, Caerleon, Mon., red cross, **Violet,** born 10th December, 1908. (Last calf January 2, 1914).

BUTTER TEST.

(The Prizes in Class 130 were given by the English Jersey Cattle Society, and entries in them were subject to any conditions issued by that Society previous to the tests.)

CLASS 130.—*Cow, eligible for or entered in the English Jersey Herd Book, obtaining the greatest number of points by the practical test*

of the separator and churn, judged by the scale of points adopted by the English Jersey Cattle Society. [12 entries.]

Certificates of Merit were also awarded to Cows under 5 *years old obtaining* 30 *points, and to Cows* 5 *years old or over obtaining* 35 *points.*

I. (Gold Medal or £10.)—J. H. Smith-Barry, Stowell Park, Pewsey, Wilts, brown Jersey, **Musette,** born 30th July, 1909 ; s Fleur de Lys (9583), d Marigold, s d Sportive (7037). (Last calf March 17, 1914).

II. (Silver Medal.)—Lord Rothschild, Tring Park, Tring, Herts, broken, Jersey, **Coulisse 15th,** born 25th April, 1908, bred by C. Le Cuirot, Grouville, Jersey ; s Morny Cannon (7598), d Coulisse 9th (10916 P.S.H.C.), s d Oxford Lad (7612).

III. (Bronze Medal).—J. H. Smith-Barry, Jersey, **Flower Girl,** born 28th June, 1909 ; s Oxford Sunbeam (8650), d Lily, s d Dryden (8158). (Last calf January 16, 1914).

Certificates of Merit.—Miss Enderby, Beckington, Bath, brown, Jersey, **Favour's Fortune,** born 8th May, 1908, bred by the late J. W. Steeds, New Close Farm, Frome, Somerset; s Black Bob (9149), d Favour's Flower (Vol. xvii., p. 293), s d Flower's Hero (8515).—Mrs. Evelyn, Wotton House, near Dorking, Surrey, whole black Jersey, **Sweet Daisy,** born 26th October, 1907, bred by E. J. Le Brun, Jersey ; s Handyman (J.H.B. 3940), d Ulmi 2nd (11373).—J. H. Smith-Barry, lemon and white Jersey, **Foxglove,** born 1st September, 1910 ; s Silver Fox (10097), d Flower Girl, s d Oxford Sunbeam (8650). (Last calf January 15, 1914).

SHEEP.

DEVON LONGWOOLLED.

Class 131.—*Devon Longwoolled Shearling Ram.* [6 entries.]

I. (£10.)—R. Cook, Crazelowman, Tiverton.

II. (£5.)—F. White, Torweston, Williton, Somerset.

III. (£2.)—R. Cook.

R.—F. White.

H.C.—R. Cook.—F. White.

Class 132.—*Pen of three Devon Longwoolled Shearling Ewes.* [3 entries.]

I. (£10.)—F. White, Torweston, Williton.

II. (£5.)—R. Cook, Crazelowman, Tiverton.

III. (Bronze Medal.)—F. White.

SOUTH DEVON.

CLASS 133.—*South Devon Shearling Ram.* [6 entries.]

I. (£10.)—J. S. HALLETT, Sherford, Brixton, Plymouth.

II. (£5.)—J. S. HALLETT.

III. (£2.)—P. G. BROWN, Tremadart, Duloe, Cornwall.

R.—E. H. HOSKIN, Cartuther Barton, Liskeard, Cornwall.

H.C.—R. B. TRANT, Tregrill, Menheniot, Cornwall.

CLASS 134.—*Pen of three South Devon Shearling Ewes.* [2 entries.]

I. (£10.)—J. S. HALLETT, Sherford, Brixton, Plymouth.

II. (Silver Medal.)—R. B. TRANT, Tregrill, Menheniot, Cornwall.

KENT OR ROMNEY MARSH.

(The Prizes in Class 135 were given by the Kent or Romney Marsh Sheep Breeders' Association).

CLASS 135.—*Kent or Romney Marsh Two Shear Ram.* [7 entries.]

I. (£10.)—J. E. QUESTED, The Firs, Cheriton, Kent.

II. (£5.)—W. M. CAZALET, Fairlawne, Tonbridge, bred by J. E. Quested, The Firs, Cheriton, Kent.

III. (£2.)—A. J. HICKMAN, Egerton, Kent.

R. & H.C.—L. H. AND G. W. FINN, Westwood Court, Faversham.

CLASS 136.—*Kent or Romney Marsh Shearling Ram.* [12 entries.]

I. (£10.)—J. E. QUESTED, The Firs, Cheriton, Kent.

II. (£5.)—J. E. QUESTED.

III. (£2.)—J. E. QUESTED.

R.—F. NEAME, Macknade, Faversham, Kent.

H.C.—A. J. HICKMAN, Egerton, Kent.

C.—W. M. CAZALET, Fairlawne, Tonbridge.

CLASS 137.—*Pair of Kent or Romney Marsh Ram Lambs dropped in* 1914. [5 entries.]

I. (£10.)—L. H. AND G. W. FINN, Westwood Court, Faversham.

II. (£5.)—J. E. QUESTED, The Firs, Cheriton, Kent.

III. (Bronze Medal.)—A. J. HICKMAN, Egerton, Kent.

R.—A. J. HICKMAN.

CLASS 138.—*Pen of three Kent or Romney Marsh Shearling Ewes.* [6 entries.]

I. (**£10.**)—J. E. QUESTED, The Firs, Cheriton, Kent.

II. (**£5.**)—J. E. QUESTED.

III. (**£2.**)—F. NEAME, Macknade, Faversham, Kent.

R.—A. J. HICKMAN, Egerton, Kent.

V.H.C.—A. J. HICKMAN.

SOUTHDOWN.

(The Prizes in Class 139 were given by the Southdown Sheep Society.)

CLASS 139.—*Southdown Two Shear Ram.* [6 entries.]

I. (**£10**) and Special †—W. M. CAZALET, Fairlawne, Tonbridge.

II. (**£5.**)—SIR J. COLMAN, BART., Gatton Park, Surrey.

III. (**£2.**)—SIR J. COLMAN, BART.

R.—C. ADEANE, Babraham Hall, Cambridge, bred by W. M. Cazalet, Fairlawne, Tonbridge, Kent.

H.C.—CAPTAIN D. MCCALMONT, Crockfords, Newmarket.

C.—W. M. CAZALET.

CLASS 140.—*Southdown Shearling Ram.* [12 entries.]

I. (**£10**) and **R.** for Special †—LADY WERNHER, Luton Hoo, Luton.

II. (**£5.**)—C. ADEANE, Babraham Hall, Cambridge.

III. (**£2.**)—CAPTAIN D. MCCALMONT, Crockfords, Newmarket.

R.—LADY WERNHER.

V.H.C.—W. M. CAZALET, Fairlawne, Tonbridge.

H.C.—W. M. CAZALET.—SIR J. COLMAN, BART., Gatton Park, Surrey.—SIR J. COLMAN, BART.

CLASS 141.—*Pair of Southdown Ram Lambs, dropped in* 1914. [5 entries.]

I. (**£10.**)—CAPTAIN D. MCCALMONT, Crockfords, Newmarket.

II. (**£5.**)—SIR J. COLMAN, BART., Gatton Park, Surrey.

III. (**Bronze Medal.**)—J. W. WEST, Alscot Park, Stratford-on-Avon.

R.—LADY WERNHER, Luton Hoo, Luton.

C.—W. M. CAZALET, Fairlawne, Tonbridge.

† Given by the Southdown Sheep Society, under Condition 69, a Silver Medal or £1, for the best Ram or Ram Lamb in Classes 139, 140 and 141.

CLASS 142.—*Pen of three Southdown Shearling Ewes.* [5 entries.]

I. (**£10.**)—SIR J. COLMAN, BART., Gatton Park, Surrey.

II. (**£5.**)—SIR J. COLMAN, BART.

III. (**Bronze Medal.**)—LADY WERNHER, Luton Hoo, Luton.

R.—W. M. CAZALET, Fairlawne, Tonbridge.

HAMPSHIRE DOWN.

CLASS 143.—*Hampshire Down Shearling Ram.* [8 entries.]

I. (**£10.**)—J. H. ISMAY, Iwerne Minster, Blandford; bred by J. Flower, Chilmark, Salisbury.

II. (**£5.**)—H. C. STEPHENS, Cholderton, Salisbury.

III. (**£2.**)—J. H. ISMAY; bred by H. C. Stephens, Cholderton, Salisbury.

R.—E. A. EDNEY, Five Heads Farm, Horndean, Hants.

H.C.—H. C. STEPHENS.—B. J. WATERS, Flamstone, Bishopstone, Salisbury.

CLASS 144.—*Pair of Hampshire Down Ram Lambs, dropped in* 1914. [6 entries.]

I. (**£10.**)—CAPTAIN J. A. MORRISON, Berwick House, Hindon, Salisbury.

II. (**£5.**)—H. C. STEPHENS, Cholderton, Salisbury.

III. (**£2.**)—J. H. ISMAY, Iwerne Minster, Blandford.

R.—CAPTAIN J. A. MORRISON.

H.C.—B. J. WATERS, Flamstone, Bishopstone, Salisbury.

C.—E. A. EDNEY, Five Heads Farm, Horndean, Hants.

CLASS 145.—*Pen of three Hampshire Down Shearling Ewes.* [1 entry.]

I. (**£10.**)—E. A. EDNEY, Five Heads Farm, Horndean, Hants.

(The Prizes in Class 146 were given by the Hampshire Down Sheep Breeders' Association).

CLASS 146.—*Pen of three Hampshire Down Ewe Lambs, dropped in* 1914. [5 entries.]

I. (**£7.**)—CAPTAIN J. A. MORRISON, Berwick House, Hindon, Salisbury.

II. (**£3.**)—J. H. ISMAY, Iwerne Minster, Blandford.

R.—B. J. WATERS, Flamstone, Bishopstone, Salisbury.

H.C.—H. C. STEPHENS, Cholderton, Salisbury.

C.—E. A. EDNEY, Five Heads Farm, Horndean, Hants.

OXFORD DOWN.

CLASS 147.—*Oxford Down Shearling Ram.* [7 entries.]

I. (£10.)—J. HORLICK, Cowley Manor, near Cheltenham.

II. (£5.)—A. BRASSEY, Heythrop Park, Oxon.

III. (£2.)—A. BRASSEY.

R.—J. HORLICK.

H.C.—G. F. MOORE, J.P., Chardwar, Bourton-on-the-Water.

CLASS 148.—*Pair of Oxford Down Ram Lambs, dropped in* 1914. [6 entries.]

I. (£10.)—J. HORLICK, Cowley Manor, near Cheltenham.

II. (£5.)—J. HORLICK.

III. (£2.)—G. F. MOORE, J.P., Chardwar, Bourton-on-the Water.

R.—T. RICH, Aldsworth, Northleach, Glos.

C.—T. RICH.

CLASS 149.—*Pen of three Oxford Down Shearling Ewes.* [3 entries.]

I. (£10.)—J. HORLICK, Cowley Manor, near Cheltenham.

II. (£5.)—J. HORLICK.

III. (Bronze Medal.)—A. BRASSEY, Heythrop Park, Oxon.

(The Prizes in Class 150 were given by the Oxford Down Sheep Breeders' Association, and will be withheld until the animals awarded the prizes are registered in the Flock Book.)

CLASS 150.—*Pair of Oxford Down Ewe Lambs, dropped in* 1914. [6 entries.]

I. (£6.)—J. HORLICK, Cowley Manor, near Cheltenham.

II. (£3.)—J. HORLICK.

III. (£1.)—T. RICH, Aldsworth, Northleach, Glos.

R.—T. RICH.

DORSET HORN.

CLASS 151.—*Dorset Horn Shearling Ram.* [2 entries.]

I. (£10.)—F. J. MERSON AND SON, Farringdon, North Petherton, Bridgwater, Somerset.

II. (Silver Medal.)—F. J. MERSON AND SON.

CLASS 152.—*Pair of Dorset Horn Ram Lambs, dropped after November* 1, 1913. [2 entries.]

I. (£10.)—F. P. BROWN, Kingston Farm, Chillerton, I.W.

II. (Silver Medal.)—F. J. MERSON AND SON, Farringdon, North Petherton, Bridgwater, Somerset.

CLASS 153.—*Pen of three Dorset Horn Shearling Ewes.* [2 entries.]

I. (£10.)—F. P. BROWN, Kingston Farm, Chillerton, I.W.

II. (Silver Medal.)—F. J. MERSON AND SON, Farringdon, North Petherton, Bridgwater, Somerset.

(The Prizes in Class 154 were given by the Dorset Horn Sheep Breeders' Association).

CLASS 154.—*Pen of three Dorset Horn Ewe Lambs, dropped after November* 1, 1913. [2 entries.]

I. (£10.)—F. P. BROWN, Kingston Farm, Chillerton, I.W.

II. (£3.)—F. J. MERSON AND SON, Farringdon, North Petherton, Bridgwater, Somerset.

DORSET DOWN.

(The Prizes in Class 155 were given by the Dorset Down Sheep Breeders' Association).

CLASS 155.—*Dorset Down Shearling Ram.* [4 entries.]

I. (£10.)—EDEN AND WATSON, Milborne Wick, near Sherborne, bred by G. C. Wood-Homer, Burdolf Manor, Dorchester.

II. (£3.)—R. TORY, Charisworth Manor, Whitchurch, Blandford.

III. (£2.)—EDEN AND WATSON.

R. & C.—R. TORY.

CLASS 156.—*Pair of Dorset Down Ram Lambs, dropped in* 1914. [4 entries.]

I. (£10.)—R. TORY, Charisworth Manor, Whitchurch, Blandford.

II. (£5.)—EDEN AND WATSON, Milborne Wick, near Sherborne.

III. (Bronze Medal.)—EDEN AND WATSON.

R. & C.—R. TORY.

CLASS 157.—*Pen of three Dorset Down Shearling Ewes.* [3 entries.]

I. (£10.)—R. TORY, Charisworth Manor, Whitchurch, Blandford.

II. (£5.)—EDEN AND WATSON, Milborne Wick, near Sherborne.

III. (Bronze Medal.)—EDEN AND WATSON.

EXMOOR HORN.

(The Prizes in Class 158 were given by the Exmoor Horn Sheep Breeders' Society).

Class 158.—*Exmoor Horn Old Ram, two shear and upwards.* [3 entries.]

I. (**£5.**)—T. C. Pearse, Leigh, Dulverton, Somerset.

II. (**£3.**)—H. Kingsford-Lethbridge, Wood, South Tawton, Okehampton, bred by D. J. Tapp, Highercombe, Dulverton, Somerset.

III. (**£2.**)—J. Robbins, Lydcot Hall, High Bray, South Molton.

Class 159.—*Exmoor Horn Shearling Ram.* [5 entries.]

I. (**£10.**)—H. Kingsford-Lethbridge, Wood, South Tawton, Okehampton.

II. (**£5.**)—H. Kingsford-Lethbridge.

III. (**Bronze Medal.**)—T. C. Pearse, Leigh, Dulverton, Somerset.

R.—J. Robins, Lydcot Hall, High Bray, South Molton.

Class 160.—*Pen of three Exmoor Horn Shearling Ewes.* [2 entries.]

I. (**£10.**)—J. Robins, Lydcot Hall, High Bray, South Molton.

II. (**Silver Medal.**)—H. Kingsford-Lethbridge, Wood, South Tawton, Okehampton.

WELSH MOUNTAIN.

Class 161.—*Welsh Mountain Ram.* [8 entries.]

I. (**£10.**)—R. Roberts, Rhydygarnedd Towyn, Merioneth.

II. (**£5.**)—T. Williams, Tyrgof Farm, Lower Cwmtwrch.

III. (**£2.**)—W. Davies, The Cefn, Pontypridd, bred by O. Price, Nantyrharn, Cray, Breconshire.

R.—W. G. and R. J. Roberts, Dyserth Hall, Dyserth, Flintshire, bred by University College, Bangor.

H.C.—D. Williams and Son, Rendhiw, Ystradgynlais, bred by D. Thomas, Nantymadog, Cray.

C.—R. H. and J. Ll. Gratton, Fron Haul Farm, Dyserth Road, Rhyl.

Class 162.—*Pen of three Welsh Mountain Ewes.* [7 entries.]

I. (**£10.**)—R. H. and J. Ll. Gratton, Fron Haul Farm, Dyserth Road, Rhyl.

II. (**£5.**)—J. G. Gratton, Foryd Farm, Abergele, Denbighshire.

III. (**£2.**)—W. G. and R. J. Roberts, Dyserth Hall, Dyserth.

R.—R. Roberts, Rhydygarnedd, Towyn, Merioneth.

H.C.—W. Davies, The Cefn, Pontypridd.

C.—D. Thomas, Nantmadog, Cray, Brecon.

RYELAND.

Class 163.—*Ryeland Ram.* [5 entries.]

I. (£10.)—F. E. Gough, The Moor, Bodenham.

II. (£5.)—H. A. Christy, Llangoed Castle, Llyswen, Brecon.

III. (Bronze Medal.)—J. G. and C. Clement, Scurlage Castle, Reynoldston, S.O., Glam., bred by E. Jones, Penybont Farm, Breconshire.

R.—Mrs. R. Herbert, Clytha Park, Abergavenny, bred by H. A. Christy, Llangoed, Boughrood, Breconshire.

Class 164.—*Pen of three Ryeland Ewes.* [3 entries.]

I. (£10.)—H. A. Christy, Llangoed Castle, Llyswen, Brecon.

II. (£5.)—Mrs. R. Herbert, Clytha Park, Abergavenny.

III. (Bronze Medal.)—Mrs. R. Herbert, bred by D. J. Thomas, Talachddu Farm, Breconshire.

KERRY.

(The Prizes in Classes 165 and 166 were offered by the Swansea Local Committee, and competition was confined to residents in the Counties of Glamorgan, Carmarthen, Pembroke, Cardigan, Brecon and Radnor).

Class 165.—*Kerry Ram—First prize,* £5—*second,* £2—*third,* £1.

[No Entry.]

Class 166.—*Pen of three Kerry Ewes—First prize,* £5—*second,* £2—*third,* £1.

[No Entry.]

PIGS.

BERKSHIRE.

CLASS 167.—*Berkshire Boar, farrowed in* 1911, 1912 *or* 1913. [7 entries.]

I. (£7) and R. for Special†—L. CURRIE, Minley Manor, Farnborough, Hants, **Minley Warrior** (15982), born 17th January, 1911; s Highmoor Viscount, (12721), d Motcombe Kitty (14628), s d Dorset Edward (14007).

II. (£3.)—W. BUCKLEY, Moundsmere Manor, Basingstoke, **Moundsmere John** (16600), born 15th June, 1912; s Goldicote John (15003), d Hail Columbia (15063), s d Sir Peter H (13251).

III. (£2.)—MRS. W. H. PALMER, Murrell Hill, Binfield, **Whitley Kitchener** (16436), born 21st June, 1911, bred by the Reading Corporation, Manor Farm, Reading; s Netherswell King (15469), d Lady Magdalin 2nd (13010).

CLASS 168.—*Pair of Berkshire Boars, farrowed in* 1914. [4 entries.]

I. (£5.)—W. BUCKLEY, Moundsmere Manor, Basingstoke, born 8th January; s Herriard Othello (17097), d Moundsmere Kernel (16529), s d Axford Viscount (15008).

CLASS 169.—*Berkshire Breeding Sow, farrowed before* 1914. [6 entries.]

I. (£7) and Special (£5) †—L. CURRIE, Minley Manor, Farnborough, Hants, **Minley Primrose** (15099), born 18th January, 1910; s Compton Supreme (13989), d Minley Rosamond (13907), s d Highmoor Viscount (12721).

II. (£3.)—MRS. W. H. PALMER, Murrell Hill, Binfield, **Moundsmere Betka** (16676), born 2nd January, 1912, bred by W. Buckley, Moundsmere Manor; s Axford Viscount (15008), d Hairbell 1st (15041).

III. (£2.)—W. BUCKLEY, Moundsmere Manor, Basingstoke, **Moundsmere Columbine** (16653), born 15th June, 1912; s Goldicote John (15003), d Hail Columbia (15063), s d Sir Peter H. (13251).

CLASS 170.—*Pair of Berkshire Breeding Sows, farrowed in* 1914. [5 entries.]

I. (£5.)—L. CURRIE, Minley Manor, Farnborough, Hants, born 3rd, January; s Great Scott 2nd (15238), d Minley Rosebud (15989), s d Heymoor Viscount (12721).

II. (£2.)—W. BUCKLEY, Moundsmere Manor, Basingstoke, born 8th January; s Herriard Othello (17097), d Moundsmere Kernel (16529), s d Axford Viscount (15008).

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† Given by the British Berkshire Society for the best Boar or Sow in the Berkshire Classes entered in, or eligible for, the Herd Book, whose sire and dam, together with the name of its Breeder are entered in the Catalogue.

LARGE BLACK.

Class 171.—*Large Black Boar, farrowed in* 1911, 1912, *or* 1913. [5 entries.]

I. (**£7.**)—T. F. Hooley, Dry Drayton, near Cambridge, **Drayton Peter** (4017), born 16th April, 1912; s Henley Achilles (1999), d Drayton Violet (9010), s d Drayton Demon 4th (2353).

II. (**£3.**)—S. F. Edge, Gallops Homestead, Ditchling, Hassocks, Sussex, **Valley Happy Boy** (3515), born 6th January, 1911, bred by J. Olver, Woodland Valley, Ladock, Cornwall; s Trethawle Happy Boy (3121), d Queen of the Valley (7984), s d The Prior (1427).

III. (**Bronze Medal.**)—T. Warne, Trevisquite Manor, St. Mabyn, Cornwall, **Yealmpton Stranger,** born 13th May, 1913, bred by J. S. Ford, Yealmpton, Devon; s Jupiter (3835), d Yealmpton Duchess (10418), s d Brent Prince (3195).

Class 172.—*Pair of Large Black Boars, farrowed in* 1914. [5 entries.]

I. (**£5.**)—T. Warne, Trevisquite Manor, St. Mabyn, Cornwall, born 2nd January; s Treveglos Jockey (3811), d Godiva 4th (16520).

II. (**£2.**)—T. F. Hooley, Dry Drayton, near Cambridge, born 16th January; s Docking Victor (4221), d Drayton Babie (10728), s d Henley Achilles (1999).

III. (**Bronze Medal.**)—T. Warne, born 3rd January; s Treveglos Jockey (3811), d Trevisquite Content 4th (6934).

R.—W. and H. Whitley, Primley Farm, Paignton, born 12th January; s Tiptree 1st (2933), d Brent Susie 4th (7562), s d Whalesborough Chief (717).

Class 173.—*Large Black Breeding Sow, farrowed before* 1914. [5 entries.]

I. (**£7.**)—S. F. Edge, Gallops Homestead, Ditchling, Hassocks, Sussex, **Cornwood Lass 45th** (1195), born 2nd March, 1913, bred by J. Glover, Cornwood, South Devon; s Henley Victor (2947), d Cornwood Lass 36th (10248), s d Drayton Dandy (3331).

II. (**£3.**)—T. F. Hooley, Dry Drayton, near Cambridge, **Drayton Mayflower** (13138), born 12th January, 1913; s Oaklands Victor (3579), d Drayton Maud 2nd (10726), s d Henley Victor (2947).

III. (**Bronze Medal.**)—J. C. Olver, Woodland Valley, Ladock, Cornwall, **Valley Lady,** born January, 1913; s Old Fashion, d Menna Choice, s d Wonder of West.

R.—T. Warne, Trevisquite Manor, St. Mabyn, Cornwall, born 21st July, 1913; s Treveglos Jockey (3811), d Trevisquite Content 5th (10868).

V.H.C.—Miss K. Kay-Mouat, Heathlands Farm, Malvern, Wells, Worcestershire, **McHeather Beauty,** born 19th February, 1912; s Treveglos Sammy (4415), d Heather Betsy (11556), s d Bentley King M'Panda (3293).

(The Prizes in Class 174 were given by the Large Black Pig Society).

CLASS 174.—*Large Black Breeding Sow, not exceeding* 12 *months old on May* 1, 1914. [5 entries.]

I. (£7.)—T. WARNE, Trevisquite Manor, St. Mabyn, Cornwall, born 21st July, 1913; s Treveglos Jockey (3811), d Trevisquite Content 5th (10868).

II. (£3.)—J. C. OLVER, Woodland Valley, Ladock, Cornwall, **Valley Hopeful,** born September, 1913; s Paignton Cæsar, d Queen of the Valley 7th, s d Bosoka Masterpiece.

III. (£2.)—W. AND H. WHITLEY, Primley Farm, Paignton, **Primley Flora,** born 2nd May, 1913; s Brent Topper (3691), d Primley Carnation (10164), s d Primley Marquis (2451).

R.—T. WARNE, Trevisquite Manor, St. Mabyn, Cornwall, born 21st July, 1914; s Treveglos Jockey (3811), d Trevisquite Content 5th (10868).

CLASS 175.—*Pair of Large Black Breeding Sows, farrowed in* 1914. [4 entries.]

I. (£5.)—T. F. HOOLEY, Dry Drayton, near Cambridge, born 10th January; s Docking Victor (4221), d Drayton Hope (9724), s d Henley Victor (2947).

II. (£2.)—W. AND H. WHITLEY, Primley Farm, Paignton, born 12th January; s Tiptree 1st (2933), d Brent Susie 4th (7562), s d Whalesborough Chief (717).

III. (Bronze Medal.)—J. C. OLVER, Woodland Valley, Ladock, Cornwall, born 4th January; s Valley Afterthought, d Menna Choice, s d Wonder of the West.

LARGE WHITE.

CLASS 176.—*Large White Boar, farrowed in* 1911, 1912 *or* 1913. [3 entries.]

I. (£7.)—SIR G. GREENALL, BART., Walton Hall, Warrington, **Worsley Turk 51st** (16621), born 2nd January, 1912, bred by the Earl of Ellesmere, Worsley Hall, Manchester: s Worsley Turk 30th (15535), d Worsley Miss 18th (30336), s d Worsley Turk 4th (11217).

II. (£3.)—J. M. DUGDALE, Llwyn, Llanfyllin, Mont., **Llwyn Turk** (15099), born 4th January, 1911; s Worsley Turk 25th (15529), d Llwyn Sunlight (32482), s d Hero of Llwyn (12565).

III. (Bronze Medal.)—R. E. W. STEPHENSON, Tue Brook, Liverpool, **West Derby Bashful Lad** (16419), born 14th July, 1911; s Bottesford Bashful Lad 2nd (13293), d Grantham Marchioness (28462), s d Mollington of Nottingham (11817).

CLASS 177.—*Pair of Large White Boars, farrowed in* 1914. [3 entries.]

I. (£5.)—J. M. DUGDALE, Llwyn, Llanfyllin, Mont, born 13th January; s Emperor of Llwyn (16081), d Llwyn Matchless 1st (35540), s d Worsley Turk 25th (15529).

Class 178.—*Large White Breeding Sow, farrowed before* 1914. [4 entries.]

I. (£7.)—Sir G. Greenall, Bart., Walton Hall, Warrington, **Worsley Lady 7th** (36550), born 10th January, 1912, bred by the Earl of Ellesmere, Worsley Hall, Manchester; s Worsley Turk 18th (14323), d Ladylike of Worsley 3rd (28816), s d Bouncing Boy of Nottingham (10627).

II. (£3.)—Sir G. Greenall, Bart., **Worsley Empress 37th** (30280), born 2nd January, 1910, bred by the Earl of Ellesmere, Worsley Hall, Manchester; s Turk of Worsley (12833), d Bottesford Empress 3rd (16714), s d Borrowfield Ringleader 20th (6291).

III. (**Bronze Medal.**)—R. E. W. Stephenson, Tue Brook, Liverpool, **Tallington Companion** (29914), born 10th January, 1909, bred by W. E. Measures, Tallington: s Ruddington Right Stamp (8717), d Tallington Carnation (21716), s d Worsley Monarch 19th (9371).

R.—J. M. Dugdale, Llwyn, Llanfyllin, Mont, **Llwyns Matchless 2nd.** born 5th January, 1913; s Emperor of Llwyn (16081), d Llwyn Matchless (35540), s d Worsley Turk 25th (15529).

Class 179.—*Pair of Large White Breeding Sows, farrowed in* 1914. [4 entries.]

I. (£5.)—R. E. W. Stephenson, Tue Brook, Liverpool, born 1st January; s West Derby Bashful Lad (16419), d West Derby Frisky 8th (36318), s d Bourne Giant Goliath (10631).

II. (£2.)—Sir G. Greenall, Bart., Walton Hall, Warrington, born 1st January; s Walton Don 4th (Vol. xxx.), d Worsley Queen 49th (Vol. xxx.), s d Worsley Turk 28th (15531).

III. (**Bronze Medal.**)—J. M. Dugdale, Llwyn, Llanfyllin, Mont., born 13th January; s Emperor of Llwyn (16081), d Llwyn Matchless 1st (35540), s d Worsley Turk 25th (15529).

MIDDLE WHITE.

Class 180.—*Middle White Boar, farrowed in* 1911, 1912 *or* 1913. [4 entries.]

I. (£7.)—W. B. Hill, Underhill, Cannock Road, Wolverhampton, **Prestwood David** (15663), born 7th January, 1911; s John Junior (16639), d Prestwood Rose 3rd, s d Wharfedale Bard.

II. (£3.)—L. C. Paget, Middlethorpe Hall, York, **Sentinel of Wharfedale,** born 12th January, 1912, bred by C. Spencer, Holywell Manor, St. Ives; s Holywell Spider (15641), d Dinah of Holywell (34038).

III. (**Bronze Medal.**)—J. Chivers, Wychfield, Cambridge, **Jonathan of Histon,** born 22nd August, 1912, bred by C. Spencer, Brampton, Hunts; s Holywell Jonathan (14435), d Holywell Perfection (36944), s d Sefton of Holywell (14465).

CLASS 181.—*Pair of Middle White Boars, farrowed in* 1914.
[5 entries.]

I. (**£5.**)—L. C. PAGET, Middlethorpe Hall, York, born 10th January; s Walton Clumber 7th (14497), d Croxteth Pattie 7th (33974), s d Banker of Castlecroft (12295).

II. (**£2.**)—J. CHIVERS, Wychfield, Cambridge, born 15th January; s Wharfedale Mandarin, d Clumber Bluebell 2nd (33954), s d Clumber (13011).

III. (**Bronze Medal.**)—W. B. HILL, Underhill, Cannock Road, Wolverhampton, born 12th January, bred by Earl of Sefton, Croxteth Park, Liverpool; s Walton Clumber 7th, d Croxteth Rose 15th, s d Durnford Duke 7th.

CLASS 182.—*Middle White Breeding Sow, farrowed before* 1914.
[5 entries.]

I. (**£7.**)—W. B. HILL, Underhill, Cannock Road, Wolverhampton, **Prestwood Anne** (36970), born 8th January, 1912; s Prestwood Bugler (14451), d Holywell Gloucester (30818), s d Castlecroft Rufus.

II. (**£3.**)—L. C. PAGET, Middlethorpe Hall, York, **Halsnead Rose 6th** (34074), born 6th June, 1910, bred by Parker and Fraser, Halsnead Farm, Prescot, Lancs.; s Holywell Vicar 2nd (11281), d Halsnead Rose 1st (30704), s d Dandy Halsnead (12049).

III. (**Bronze Medal.**)—J. CHIVERS, Wychfield, Cambridge, **Mid-Vicaress** (34146), born 28th January, 1910, bred by C. Spencer, Holywell; s Holywell Middleton 3rd (13045), d Holywell Vicaress (19906), s d Holywell Viscount (8179).

R.—G. W. STARK, Forge Farm, Caerleon, born 20th January, 1909, bred by the Earl of Ellesmere, Worsley Hall, Manchester; s Tarbock Clumber (12101), d Tarbock Pattie 12th (22082), s d Walton Truant 12th (9453).

CLASS 183.—*Pair of Middle White Breeding Sows, farrowed in* 1914.
[3 entries.]

I. (**£5.**)—W. B. HILL, Underhill, Cannock Road, Wolverhampton, born 25th January, bred by the Earl of Sefton, Croxteth Park, Liverpool; s Prestwood Coronation, d Rose of Tarbock 10th.

II. (**£2.**)—L. C. PAGET, Middlethorpe Hall, York, born 10th January; s Walton Clumber 7th (14497), d Croxteth Pattie 7th (33974), s d Banker of Castlecroft (12295).

III. (**Bronze Medal.**)—J. CHIVERS, Wychfield, Cambridge, born 14th January: s Sefton of Holywell (14465), d Holly Bush 2nd (36938), s d Fordham of Holywell (14413).

TAMWORTH.

CLASS 184.—*Tamworth Boar, farrowed in* 1911, 1912 *or* 1913.
[2 entries.]

I. (**£7.**)—R. IBBOTSON, Knowle, Warwickshire, **Knowle Admiral**, born 2nd January, 1913; s Knowle Professor (15793), d Madeline (34558), s d Dick of Osmaston.

CLASS 185.—*Pair of Tamworth Boars, farrowed in* 1914. [3 entries.]

I. (£5.)—MRS. E. MORANT, Brokenhurst Park, Hants, born 7th January; s Dick of Osmaston (13143), d Dilton Tiger Lilly (31126), s d Forester of Dilton (13179).

II. (£2.)—E. DE HAMEL, Middleton Hall, Tamworth, born 16th January; s Morantus of Middleton, d Middleton Mambua, s d Milton of Middleton.

III. (Bronze Medal.)—R. IBBOTSON, Knowle, Warwickshire, born 5th January; s Osmaston Buxus (14633), d Knowle Rosamond (37316), s d Norfolk (15825).

CLASS 186.—*Tamworth Breeding Sow, farrowed before* 1914. [2 entries.]

I. (£7.)—R. IBBOTSON, Knowle, Warwickshire, **Madeline**, born 11th November, 1910, bred by Sir P. Walker, Osmaston; s Dick of Osmaston, d Aster of Osmaston.

II. (Silver Medal.)—E. DE HAMEL, Middleton Hall, Tamworth, **Middleton Masika**, born 4th January, 1910; s Gay Lad of Middleton, d Middleton Morn, s d Middleton Matoppo.

CLASS 187.—*Pair of Tamworth Breeding Sows, farrowed in* 1914. [3 entries.]

I. (£5.)—MRS. E. MORANT, Brokenhurst Park, Hants, born 6th January; s Knowle Antonio (16911), d Dilton Megellie (31128), s d Dilton Puritan (11355).

II. (£2.)—E. DE HAMEL, Middleton Hall, Tamworth, born 16th January; s Morantus of Middleton, d Middleton Mambua, s d Milton of Middleton.

PRODUCE.

CIDER.

(Open to Growers or Makers.)

(The Winners in these Classes could have Gold, Silver or Bronze Medals instead of Money Prizes if they preferred them.)

CLASS 188.—*Cask of not less than* 18 *and not more than* 30 *gallons of Cider, made in* 1913. [7 entries]

I. (£3.)—W. T. S. TILLEY.

II. (£2.)—PULLIN BROS.

III. (£1.)—H. J. HELPS.

R.—H. J. DAVIS.

CLASS 189.—12 *Bottles of Cider, made in* 1913. [10 entries.]

I. (Gold Medal.)—RIDLER AND SON.

II. (£2.)—H. J. HELPS.

III. (£1.)—PULLIN BROS.

R.—VICKERY BROS.

H.C.—W. T. S. TILLEY.

CLASS 190.—*Cask of not less than* 18 *and not more than* 30 *gallons of Cider, made in* 1913. [14 entries.]

I. (£3.)—H. J. DAVIS.

II. (£2.)—QUANTOCK VALE CIDER CO.

III. (£1.)—H. J. DAVIS.

R.—T. STONE.

H.C.—W. T. S. TILLEY.

CLASS 191.—12 *Bottles of Cider, made in* 1913. [21 entries.]

I. (£3.)—W. T. S. TILLEY.

II. (£2.)—H. J. DAVIS.

III. (£1.)—W. T. S. TILLEY.

R.—H. J. DAVIS.

H.C.—H. J. DAVIS.—QUANTOCK VALE CIDER CO.—W. T. S. TILLEY.

CLASS 192.—12 *Bottles of Cider made in any year previous to* 1913. [11 entries.]

I. (£3.)—W. T. S. TILLEY.

II. (£2.)—W. T. S. TILLEY.

III. (£1.)—T. STONE.

R.—H. J. DAVIS.

H.C.—RIDLER AND SON.

CHEESE.

CLASS 193.—*Three Cheddar Cheeses (not less than* 56*lbs. each), made in* 1913. [11 entries.]

I. (£15.)—E. E. HODDINOTT.

II. (£10.)—J. CANDY.

III. (£5.)—P. H. FRANCIS.

R. & H.C.—A. E. PADFIELD AND SON.

C.—G. D. TEMPLEMAN.

CLASS 194.—*Three Cheddar Cheeses (not over 56lbs. each), made in* 1913. [7 entries.]

I. (**£8.**)—C. C. HARDING.

II. (**£5.**)—P. H. FRANCIS.

III. (**£3.**)—S. WHITE.

R. & H.C.—J. SAGE.

CLASS 195.—*Three Single Gloucester or Wilts Cheeses, made in* 1913. [2 entries.]

I. (**£6.**)—G. D. TEMPLEMAN.

CLASS 196.—*Eight Loaf or other Truckle Cheeses, made in* 1913. [3 entries.]

I. (**£5.**)—P. H. FRANCIS.

II. (**£3.**)—A. STONE AND SON.

H.C.—J. CANDY.

CLASS 197.—*Three Caerphilly Cheeses, made in* 1914. [12 entries.]

I. (**£5.**)—WILTS UNITED DAIRIES.

II. (**£3.**)—MRS. JOHN.

V.H.C.—W. SUGDEN.

H.C.—MRS. A. MARTIN.

(The Prizes in Class 218 were given by the Glamorgan County Council).

CLASS 218.—*Three Caerphilly Cheeses, made in* 1914, *by a Student of the Glamorgan County Council Dairy or Cheese Schools.* [3 entries.]

I. (**£2.**)—MRS. JOHN.

CREAM CHEESE, BUTTER & CREAM.

(These Classes were not open to Professional Teachers).

CLASS 198.—*Three Cream or other Soft Cheeses.* [10 entries.]

I. (**£3.**)—MRS. A. MARTIN.

II. (**£2.**)—MISS A. PERKINS.

III. (**£1.**)—WENSLEYDALE PURE MILK SOCIETY.

R.—MISS M. G. PRIDEAUX.

V.H.C.—PERKINS AND SON.

H.C.—MISS F. M. TWOSE.—H. R. WHITE AND CO

CLASS 199.—*3lbs. of Fresh (or very slightly salted) Butter.* [21 entries.]

I. (**£4.**)—B. MILES.

I. (**£4.**)—A. F. SOMERVILLE.

II. (**£3.**)—MRS. L. R. MILDON.

II. (**£3.**)—MRS. A. UNDERWOOD.

III. (**£2.**)—J. GROVE.

III. (**£2.**)—MRS. J. WAY.

IV. (**£1.**)—J. H. HEARN.

IV. (**£1.**)—MISS C. L. OWEN.

R.—MRS. OXENHAM.

CLASS 200.—*3lbs. of Fresh (or very slightly salted) Butter, made from scalded cream.* [10 entries.]

I. (**£4.**)—MRS. L. R. MILDON.

II. (**£3.**)—A. F. SOMERVILLE.

III. (**£2.**)—J. GROVE.

R.—MRS. A. A. BERE.

CLASS 201.—*3lbs. of Butter, in the making of which no salt has been used, to be judged on the last day of Show.* [14 entries.]

I. (**£4.**)—MISS R. A. JEFFREYS.

II. (**£3.**)—A. F. SOMERVILLE.

III. (**£2.**)—MRS. L. R. MILDON.

IV. (**£1.**)—MRS. A. UNDERWOOD.

R. & V.H.C.—MRS. OXENHAM.

V.H.C.—MRS. R. W. JONES.—MRS. H. THOMAS.—MRS. J. WAY.

CLASS 202.—*Not less than 6lbs. of Fresh Butter packed for transit.* [4 entries.]

I. (**£3.**)—MRS. A. MARTIN.

II. (**£1 10s.**)—MISS LEWIS.

CLASS 203.—*12lbs. of Keeping Butter, in a jar or crock, delivered to the Secretary four weeks before the Show.* [8 entries.]

I. (**£4.**)—MRS. L. R. MILDON.

II. (**£3.**)—MRS. A. A. BERE.

III. (**£2.**)—MRS. J. GEORGE.

R.—MRS. W. H. EVANS.

H.C.—MRS. O. T. JENKINS.

CLASS 204.—*Four half-pounds of Scalded Cream.* [7 entries.]

I. (£3.)—MISS D. C. VIVIAN.

II. (£2.)—MRS. L. R. MILDON.

III. (£1.)—MISS M. G. PRIDEAUX.

R. & H.C.—J. LLOYD AND CO.

(The Prizes in Classes 219 and 220 were given by the Glamorgan County Council).

CLASS 219.—*3lbs. of Fresh Butter, in the making of which no salt has been used, made by a student of the Glamorgan County Council Dairy or Cheese Schools.* [7 entries.]

I. (£2.)—MRS. E. WATTS.

II. (£1.)—MRS. H. THOMAS.

III. (10s.)—MRS. M. E. ROGERS.

R.—MISS S. JEFFREYS.

H.C.—MRS. W. WATTS.

CLASS 220.—*3lbs. of Fresh (slightly salted) Butter, made by a Student of the Glamorgan County Dairy or Cheese Schools.* [5 entries.]

I. (£2.)—MRS. M. E. ROGERS.

II. (£1.)—MRS. E. WATTS.

III. (10s.)—MISS S. JEFFREYS.

R. & H.C.—MRS. W. WATTS.

COMPETITIONS.

BUTTER-MAKING.

(No winner of a first prize given by this Society for Butter-making during the last three years was eligible to compete in Class 205 or 206).

CLASS 205.—*For first year students who had been through a course of instruction in Butter-making at any County Council School since the Society's last Show. On the second day of Show.* [16 entries.]

I. (£4.)—MISS M. WATTS.

II. (£3.)—MISS M. E. JENKINS.

III. (£1 10s.)—MISS E. BEER.

IV. (£1.)—MISS S. BEYNON.

R. & V.H.C.—MISS C. JONES.

H.C.—MISS S. A. MORGAN.—MRS. S. TAYLOR.

C.—MISS W. TOVEY.—MISS F. D. WARNE.

CLASS 206.—*For Men and Women, on the third day of Show.* [39 entries.]

I. (**£4.**)—MISS J. JAMES.

II. (**£3.**)—MRS. M. C. WALLACE.

III. (**£1 10s.**)—MISS E. ADDIS.

IV. (**£1.**)—MRS. M. H. JONES.

R. & V.H.C.—T. M. TREWHELLA.

H.C.—MISS E. BEER.—MISS R. A. JEFFREYS.—MISS E. M. TREGEA.—MRS. W. WATTS.—MISS J. WILLIAMS.

C.—MISS S. BEYNON.—MISS A. MORGAN.—MISS C. PANTALL.

CLASS 207.—*For Men and Women, on the fourth day of Show.* [40 entries.]

I. (**£4.**)—MISS J. PRICHARD.

II. (**£3.**)—MRS. E. WATTS.

III. (**£1 10s.**)—MISS J. WILLIAMS.

R. & V.H.C.—MISS E. ADDIS.

H.C.—MISS C. PANTALL.—T. M. TREWHELLA.

C.—MISS E. JAMES.—MISS F. D. WARNE.—MRS. W. WATTS.—MISS H. M. WILLIAMS.

CLASS 208.—*For winners of first and second Prizes in the Butter-making Classes* 205, 206, *and* 207, *or at any previous meeting of the Society. On the fifth day of Show.* [8 entries.]

I. ((Gold Medal.)—MISS J. WILLIAMS.

II. (Silver Medal.)—MISS M. WATTS.

III. (Bronze Medal.)—MISS E. JAMES.

R.—MRS. W. WATTS.

(The Prizes in Class 221 to 225 were given by the Glamorgan County Council, and were open only to Students who had attended the Glamorgan County Council Dairy or Cheese Schools).

CLASS 221.—*On the first day of Show for Competitors who had not won a prize at the London Dairy Show or the Shows of the Bath and West and Southern Counties, Royal Agricultural and Welsh National Societies.* [17 entries.]

I. (**£2.**)—MISS K. PRICE.

II. (**£1 10s.**)—MISS M. WATTS.

III. (**£1.**)—MISS MARIE JONES.

IV. (**10s.**)—MISS W. JAMES.

R. & V.H.C.—MISS C. JONES.

H.C.—MISS S. BEYNON.—MISS A. PRICHARD.

C.—MISS M. MORGAN.

CLASS 222.—*On the second day of Show.* [26 entries.]

I. (**£2.**)—MRS. W. WATTS.

II. (**£1 10s.**)—MISS M. MORGAN.

III. (**£1.**)—MISS W. JAMES.

IV. (**10s.**)—MISS M. WATTS.

R. & V.H.C.—MRS. M. H. JONES.

H.C.—MISS S. BEYNON.—MISS A. PRICHARD.

C.—MISS S. JEFFREYS.

CLASS 223.—*On the third day of Show.* [24 entries.]

I. (**£2.**)—MRS. M. H. JONES.

II. (**£1 10s.**)—MISS J. WILLIAMS.

III. (**£1.**)—MISS S. BEYNON.

IV. (**10s.**)—MISS ELEANOR DAVIES.

R. & V.H.C.—MISS M. E. JENKINS.

H.C.—MISS MARIE JONES.

C.—MISS C. JONES.—MISS M. PRICHARD.—MRS. E. WATTS.—MISS M. WATTS.

CLASS 224.—*On the fourth day of Show.* [23 entries.]

I. (**£2.**)—MISS S. BEYNON.

II. (**£1 10s.**)—MISS J. WILLIAMS.

III. (**£1.**)—MISS M. WATTS.

IV. (**10s.**)—MRS. E. WATTS.

R. & V.H.C.—MISS ELEANOR DAVIES.

H.C.—MISS M. HOWELLS.—MISS M. E. LANG.—MISS M. PRICHARD.

C.—MISS J. MORGAN.

CLASS 225.—*On the fifth day of Show.* [19 entries.]

I. (**£2.**)—MRS. E. WATTS.

II. (**£1 10s.**)—MISS M. WATTS.

III. (**£1.**)—MISS ELEANOR DAVIES.

IV. (**10s.**)—MISS M. PRICHARD.

R. & V.H.C.—MISS M. E. JENKINS.

H.C.—MISS MARIE JONES.—MISS M. E. LANG.

C.—MISS J. DAVIES.—MISS R. A. JEFFREYS.—MISS C. JONES.—MISS MARY M. JONES.

MILKING.

CLASS 209.—*For Men* 18 *years of age and over.* [6 entries.]

I. (£1 10s.)—A. M. HOSKIN.

II. (£1.)—T. M. TREWHELLA.

III. (15s.)—J. GROVE.

R.—J. J. LEWIS.

H.C.—J. LOWE.

CLASS 210.—*For Women* 18 *years of age and over* [9 entries.]

I. (£1 10s.)—MRS. M. JONES.

II. (£1.)—MRS. W. H. EVANS.

III. (15s.)—MISS E. JAMES.

IV. (10s.)—MISS D. E. NICHOLAS.

R. & V.H.C.—MISS S. A. MORGAN.

V.H.C.—MISS W. JAMES.

H.C.—MISS M. JONES.

C.—MISS M. YEO.

CLASS 211.—*For Boys and Girls under* 18 *years of age.* [2 entries.]

I. (£1 10s.)—MISS N. JONES.

II. (£1.)—MISS M. SHEPHERD.

SHOEING.

CLASS 212.—*For Nag Horse Shoeing, by Smiths* 25 *years of age and over on the day of the competition, who had not previously won the First Prize in a corresponding Class at one of the Society's meetings, or a Champion Prize at any National or County Agricultural Society's Show, on the second day of Show.* [35 entries.]

I. (£4) and Special **(£2)***—F. R. WHITEHORN, R.S.S.

II. (£3) and Special **(£1)***—R. DAVIES.

III. (£2.)—T. G. FELTHAM, A.F.C.L.

IV. (£1.)—EDWARD JONES.

R. & V.H.C. and **R.** for Special*—T. PRICE, R.S.S.

V.H.C.—E. EVANS, A.F.C.L.

H.C.—A. JONES, R.S.S.—C. F. MESSENGER, A.F.C.L.—W. MORGAN.—D. A. OWEN.—W. PRICE, A.F.C.L.—D. J. THOMAS, R.S.S.

* Given by the Swansea Local Committee for the best competitors in Class 212 resident in the Counties of Glamorgan, Carmarthen, Pembroke, Cardigan, Brecon or Radnor, who had never won a 1st Prize at the Bath and West or Royal Shows.

CLASS 213.—*For Cart Horse Shoeing, by Smiths* 25 *years of age and over on the day of the competition, who had not previously won the First Prize in a corresponding Class at one of the Society's meetings, or a Champion Prize at any National or County Agricultural Society's Show, on the third day of Show.* [41 entries.]

I. (**£4**) and Special (**£2**)*—T. PRICE, R.S.S.

II. (**£3**) and Special (**£1**)*—W. PRICE, A.F.C.L.

III. (**£2**) and **R.** for Special*— D. JONES, R.S.S.

IV. (**£1.**)—J. W. JONES, R.S.S.

R. & V.H.C.—D. DAVIES, R.S.S.

V.H.C.—T. EDWARDS, R.S.S.—H. EVANS.—A. E. FELTHAM, R.S.S.—F. R. WHITEHORN, R.S.S.

H.C.—C. F. MESSENGER, A.F.C.L.—D. J. THOMAS, R.S.S.—M. THOMAS, R.S.S.—J. J. WILLIAMS, R.S.S.

C.—W. FARR.—D. GRIFFITHS.—EVAN JONES.—L. JONES.—D. A. OWEN.—P. J. WILLIAMS, R.S.S.

CLASS 214.—*For Shoe Making or Turning, by Smiths under* 25 *years of age on the day of the competition, the patterns and descriptions of the Shoes being supplied by the Judge on the fourth day of Show.* [10 entries.]

I. (**£4.**)—J. DAVIES.

II. (**£3.**)—T. S. BRIGHT.

III. (**£1.**)—W. J. THOMAS.

IV. (**10s.**)—H. DAVIES.

R. & V.H.C.—F. STEPHENS.

H.C.—D. L. JAMES.—A. E. WATKINS, R.S.S.

C.—E. F. FELTHAM.

CLASS 215.—*For Shoe Making or Turning, by Smiths* 25 *years of age and over on the day of the competition, the patterns and descriptions of the Shoes being supplied by the Judge on the fourth day of Show.* [16 entries.]

I. (**£4.**)—E. EVANS, A.F.C.L.

II. (**£3.**)—H. JONES.

III. (**£2.**)—W. PRICE, A.F.C.L.

IV. (**£1.**)—F. R. WHITEHORN, R.S.S.

* Given by the Swansea Local Committee for the best Competitors in Class 213 resident in the Counties of Glamorgan, Carmarthen, Pembroke, Cardigan, Brecon or Radnor, who had never won a 1st Prize at the Bath and West or Royal Shows.

R. & V.H.C.—P. J. Williams, R.S.S.

V.H.C.—D. Davies, R.S.S.—T. G. Feltham, A.F.C.L.

H.C.—A. Jones, R.S.S.—J. Rees, A.F.C.L.

C.—T. Morgan.

TIMBERING AND SPLICING COMPETITIONS.

(The Prizes in Classes 216 and 217 were given by the Swansea Local Committee.)

Class 216.—*Timbering Competition, open to Timbermen and Colliers, on the fourth day of Show.* [15 entries.]

I. (£4.)—S. Richards and Partners.
II. (£2.)—D. Jones ,,
III. (£1.)—G. Nash ,,
R.—M. Williams ,,

Class 217.—*For the best Splice in Colliery Rope, on the fourth day of Show.* [9 entries.]

I. (£4.)—R. Griffiths and Partners.
II. (£2.)—T. Llewellyn ,,
III. (£1.)—S. Rees ,,
R.—R. Jones ,,

POULTRY.

(UNDER POULTRY CLUB RULES.)

(The Birds in Classes 1 to 49 must have been hatched previous to January 1, 1914.)

CLASS 1.—ANY DISTINCT BREED EXCEPT BANTAMS—COCK AND THREE HENS, BRED IN 1912 OR 1913, THE PROPERTY OF ONE EXHIBITOR MATED FOR BREEDING. [11 entries.]

I. (**£3.**)—G. H. PROCTER, *Cochins.*

II. (**£2.**)—S. W. THOMAS, *Houdans.*

III. (**£1.**)—CAPTAIN M. DE BATHE, *Blue Orpingtons.*

R.—J. H. BAKER AND SONS, *Indian Game.*

V.H.C.—MRS. E. CALLARD.

H.C.—M. LINDNER, *Orpingtons.*

C.—J. HUGHES-REES, *Plymouth Rocks.*

CLASS 2.—COCHIN OR BRAHMA, COCK. [5 entries.]

I. (**£1.**)—S. W. THOMAS, *Brahma.*

II. (**15s.**)—MRS. E. CALLARD, *Cochin.*

R.—G. H. PROCTER.

V.H.C.—J. C. TOZER.

CLASS 3.—COCHIN OR BRAHMA, HEN. [4 entries.]

I. (**£1.**)—G. H. PROCTER.

II. (**15s.**)—MRS. E. CALLARD. *Cochin.*

R.—S. W. THOMAS, *Brahma.*

CLASS 4.—PLYMOUTH ROCK, COCK. [3 entries.]

I. (**£1.**)—MRS. E. CALLARD.

II. (**15s.**)—J. M. CHANDLER.

R.—J. W. WALL.

CLASS 5.—PLYMOUTH ROCK, HEN. [3 entries.]

I. (**£1.**)—MRS. E. CALLARD.

II. (**15s.**)—J. M. CHANDLER.

V.H.C.—J. GREENFIELD AND SON.

CLASS 6.—ORPINGTON (BUFF), COCK. [14 entries.]

I. (£1.)—C. WATSON.
II. (15s.)—CARNE BROS.
III. (10s.)—R. L. MOND. J.P
R.—R. ANTHONY.
V.H.C.—W. PRICE.
H.C.—S. W. THOMAS.
C.—LEWIS AND JOHN.

CLASS 7.—ORPINGTON (BUFF), HEN. [13 entries.]

I. (£1.)—G. PONTING.
II. (15s.)—S. W. THOMAS.
III. (10s.)—R. ANTHONY.
R.—S. J. STACEY.
V.H.C.—J. LEWIS AND SON.
H.C.—D. B. EDWARDS.
C.—G. PONTING.

CLASS 8.—ORPINGTON (BLACK), COCK. [12 entries.]

I. (£1.)—W. BURCH.
II. (15s.)—T. JAMES.
III. (10s.)—W. H. L. WEATHERLEY.
R.—A. SMITH.
V.H.C.—W. HANCOCK.
H.C.—CARNE BROS.

CLASS 9.—ORPINGTON (BLACK), HEN. [12 entries.]

I. (£1.)—H. LAURENCE.
II. (15s.)—JENKINS AND THOMAS.
III. (10s.)—CARNE BROS.
R.—W. LEWIS.
V.H.C.—THOMAS BROS.
H.C.—THOMAS BROS.
C.—W. H. L. WEATHERLEY.

CLASS 10.—ORPINGTON (WHITE), COCK. [6 entries.]

I. (£1.)—M. LINDNER.
II. (15s.)—M. LINDNER.
III. (10s.)—C. WATSON.
R.—WEAVER BROS.

Class 11.—ORPINGTON (White), HEN. [9 entries.]

I. (£1.)—R. L. Mond, J.P.
II. (15s.)—M. Lindner.
III. (10s.)—A. Starley.
R.—R. L. Mond, J.P.
H.C.—Lord Rothschild.

Class 12.—MINORCA, COCK. [8 entries.]

I. (£1.)—A. G. Pitts.
II. (15s.)—Fursland Bros.
III. (10s.)—G. Cleaves.
R.—A. G. Pitts.
V.H.C.—Lady Fitzgerald.

Class 13.—MINORCA, HEN. [14 entries.]

I. (£1.)—Fursland Bros.
II. (15s.)—Fursland Bros.
III. (10s.)—A. G. Pitts.
R.—W. Fry.
V.H.C.—L. Edmonds.

Class 14.—RHODE ISLAND (Red), COCK OR HEN. [8 entries.]

I. (£1.)—Johns Bros.
II. (15s.)—J. Harries.
III. (10s.)—H. Hunkin.
R.—H. T. Soltan.
V.H.C.—H. T. Soltan.
H.C.—Miss L. Rees.
C.—G. Lewis.

Class 15.—SUSSEX, COCK. [7 entries.]

I. (£1.)—R. L. Mond, J.P.
II. (15s.)—Lord Rothschild.
III. (10s.)—F. H. Wheeler.
R.—F. H. Wheeler.
V.H.C.—A. J. Falkenstein.
C.—Lord Rothschild.

CLASS 16.—SUSSEX, HEN. [9 entries.]

I. (£1.)—LORD ROTHSCHILD.
II. (15s.)—F. H. WHEELER.
III. (10s.)—A. J. FALKENSTEIN.
R.—LORD ROTHSCHILD.
V.H.C.—S. BATCUP.
H.C.—F. H. WHEELER.
C.—MRS. E. K. WRIGHT.

CLASS 17.—DORKING (ANY VARIETY), COCK. [4 entries.]

I. (£1.)—CAPTAIN G. PHIPPS HORNBY.
II. (15s.)—A. C. MAJOR.
R.—A. C. MAJOR.
V.H.C.—R. ALTY.

CLASS 18.—DORKING (ANY VARIETY). HEN. [5 entries.]

I. (£1.)—A. C. MAJOR.
II. (15s.)—J. HARRIS.
R.—A. C. MAJOR.
V.H.C.—CAPTAIN G. PHIPPS HORNBY.
H.C.—R. ALTY.

CLASS 19.—FAVEROLLES, COCK. [2 entries.]

I. (£1.)—R. L. MOND, J. P.

CLASS 20.—FAVEROLLES. HEN. [1 entry.]

I. (£1.)—THOMAS AND JONES.

CLASS 21.—LANGSHAN, COCK. [8 entries.]

I. (£1.)—R. ANTHONY.
II. (15s.)—N. M. JOHNSTON.
III. (10s.)—E. E. THOMAS.
R.—C. H. DRURY.
V.H.C.—B. BUTLAND.
H.C.—W. A. JUKES.
C.—R. B. PRICE.

CLASS 22.—LANGSHAN, HEN. [1 entry.]

I. (£1.)—R. ANTHONY.

CLASS 23.—WYANDOTTE (SILVER OR GOLD LACED), COCK. [4 entries.]

I. (£1.)—S. CLIMAS.
II. (15s.)—A. HOLDEN.
R.—T. H. FURNESS.
H.C.—E. J. JARRETT.

CLASS 24.—WYANDOTTE (SILVER OR GOLD LACED), HEN. [6 entries.]

I. (£1.)—A. HOLDEN.
II. (15s.)—T. H. FURNESS.
III. (10s.)—S. CLIMAS.
R.—J. HUGHES-REES.
H.C.—C. WOOLLS.

CLASS 25.—WYANDOTTE (WHITE), COCK. [13 entries.]

I. (£1.)—R. ANTHONY.
II. (15s.)—H. GUNN.
III. (10s.)—MRS. E. CALLARD.
R.—E. HENRY.
V.H.C.—LADY FITZGERALD.
H.C.—W. JONES.

CLASS 26.—WYANDOTTE (WHITE), HEN, [9 entries.]

I. (£1.)—MRS. E. CALLARD.
II. (15s.)—R. ANTHONY.
III. (10s.)—T. H. FURNESS.
R.—J. PRICE.
V.H.C.—W. JONES.
H.C.—W. JONES.

CLASS 27.—WYANDOTTE (BLACK), COCK. [6 entries.]

I. (£1.)—A. HOLDEN.
II. (15s.)—W. SHARPE.
III. (10s.)—T. H. FURNESS.
R.—REV. E. L. JONES.
V.H.C.—W. B. HARRIES.

CLASS 28.—WYANDOTTE (BLACK), HEN. [11 entries.]

I. (£1.)—W. SHARPE.
II. (15s.)—A. HOLDEN.

III. **(10s.)**—R. ANTHONY.
R.—G. WOOD.
V.H.C.—COLES AND HOLTON.
H.C.—T. H. FURNESS.

CLASS 29.—WYANDOTTE (ANY OTHER VARIETY), COCK. [5 entries.]

I. **(£1.)**—H. GUNN.
II. **(15s.)**—A. HOLDEN, *Partridge*.
R.—J. H. EVANS, *Blue*.
V.H.C.—MASTER W. DARKE, *Partridge*.
H.C.—T. H. FURNESS.

CLASS 30.—WYANDOTTE (ANY OTHER VARIETY), HEN. [7 entries.]

I. **(£1.)**—J. WHARTON.
II. **(15s.)**—H. GUNN.
III. **(10s.)**—T. H. FURNESS.
R.—MASTER W. DARKE, *Partridge*.
H.C.—D. JONES.

CLASS 31.—LEGHORN (WHITE), COCK. [5 entries.]

I. **(£1.)**—LADY FITZGERALD.
II. **(15s.)**—R. ANTHONY.
R.—W. E. GILLING.
V.H.C.—A. H. STANBURY.

CLASS 32.—LEGHORN (WHITE). HEN. [7 entries.]

I. **(£1.)**—A. H. STANBURY.
II. **(15s.)**—R. ANTHONY.
III. **(10s.)**—W. PREECE AND SON.
R.—C. DINHAM.
V.H.C.—J. H. PIMBLEY.

CLASS 33.—LEGHORN (ANY OTHER VARIETY), COCK. [7 entries.]

I. **(£1.)**—E. L. SIMON.
II. **(15s.)**—R. ANTHONY.
III. **(10s.)**—J. JONES.
R.—W. T. SHERLOCK.
V.H.C.—N. RICHARDS.

CLASS 34.—LEGHORN (ANY OTHER VARIETY), HEN. [5 entries.]

I. (£1.)—R. ANTHONY.

II. (15s.)—B. NANCARROW.

R.—F. G. EDWARDS.

V.H.C.—G. H. BEVAN.

CLASS 35.—HAMBURG (BLACK), COCK. [4 entries.]

I. (£1.)—C. E. PICKLES.

II. (15s.)—W. M. DAVIES.

R.—W. SNELL.

CLASS 36.—HAMBURG (BLACK), HEN. [8 entries.]

I. (£1.)—C. E. PICKLES.

II. (15s.)—W. M. DAVIES.

III. (10s.)—R. P. INSALL.

R.—W. H. AVERY.

V.H.C.—D. W. LEWIS.—W. SNELL.

CLASS 37.—HAMBURG (ANY OTHER VARIETY), COCK. [2 entries.]

I. (£1.)—C. E. PICKLES.

CLASS 38.—HAMBURG (ANY OTHER VARIETY), HEN. [3 entries.]

I. (£1.)—R. ANTHONY.

II. (15s.)—W. H. AVERY.

R.—C. E. PICKLES.

CLASS 39.—OLD ENGLISH GAME (BLACK RED), COCK. [6 entries.]

I. (£1.)—T. HUGHES.

II. (15s.)—MASON AND EDWARDS.

III. (10s.)—W. J. BEVAN.

R.—W. ATKINS.

V.H.C.—COUNTESS OF CRAVEN.

H.C.—W. JENKINS.

CLASS 40.—OLD ENGLISH GAME (BLACK RED), HEN. [3 entries.]

I. (£1.)—COUNTESS OF CRAVEN.

II. (15s.)—D. J. MORRIS.

R.—T. HUGHES.

CLASS 41.—OLD ENGLISH GAME (ANY OTHER VARIETY), COCK.
[7 entries.]

I. (£1.)—A. HOLDEN.
II. (15s.)—W. H. LEWIS.
III. (10s.)—W. ATKINS.
R.—D. J. MORRIS.
V.H.C.—D. JONES.
H.C.—COUNTESS OF CRAVEN.

CLASS 42.—OLD ENGLISH GAME (ANY OTHER VARIETY), HEN
[7 entries.]

I. (£1.)—C. AND W. TELFORD.
II. (15s.)—COUNTESS OF CRAVEN.
III. (10s.)—W. H. LEWIS.
R.—E. C. LEWIS.
V.H.C.—D. J. MORRIS.
H.C.—D. JONES.

CLASS 43.—INDIAN GAME, COCK. [11 entries.]

I. (£1.)—J. H. BAKER AND SONS.
II. (15s.)—A. HOLDEN.
III. (10s.)—W. J. CAMP.
R.—COLES AND HOLTON.
V.H.C.—G. TEMPLEMAN.
H.C.—T. EMANUEL.

CLASS 44.—INDIAN GAME, HEN. [10 entries.]

I. (£1.)—G. TEMPLEMAN.
II. (15s.)—C. WATSON.
III. (10s.)—J. H. BAKER AND SONS.
V.H.C.—E. J. JARRETT.
H.C.—COLES AND HOLTON.—M. LINDNER.

CLASS 45.—FRENCH (EXCLUDING FAVEROLLES), COCK. [6 entries.]

I. (£1.)—S. W. THOMAS.
II. (15s.)—S. W. THOMAS.
III. (10s.)—H. EDYE, *Houdan.*
R.—H, EDYE, *Houdan.*
V.H.C.—E. G. BEVAN, *Houdan.*

CLASS 46.—FRENCH (EXCLUDING FAVEROLLES), HEN. [5 entries.]

I. (£1.)—S. W. THOMAS.

II. (15s.)—S. W. THOMAS.

R.—H. EDYE, *Houdan.*

H.C.—H. EDYE, *Houdan.*

CLASS 47.—ANY OTHER DISTINCT BREED (NOT PREVIOUSLY MENTIONED), COCK. [13 entries.]

I. (£1.)—G. C. DENNIS, *Malay.*

II. (15s.)—ABBOT BROS., *Andalusian.*

III. (10s.)—S. W. THOMAS, *Blue Orpington.*

R.—W. H. SNELL, *Black Red.*

V.H.C.—J. H. BAKER AND SONS, *Malay.*—E. LONGDEN, *Malay.*

H.C.—D. B. CHESTERFIELD, *Black Sumatra Game.*

C.—MRS. A. GWYNNE-HOWELL, *Sicilian Buttercup.*

CLASS 48.—ANY OTHER DISTINCT BREED (NOT PREVIOUSLY MENTIONED), HEN. [10 entries.]

I. (£1.)—ABBOT BROS., *Andalusian.*

II. (15s.)—E. J. JARRETT, *Malay.*

III. (10s.)—R. L. MOND, J.P.

R.—CAPTAIN M. DE BATHE, *Blue Orpington.*

V.H.C.—J. H. BAKER AND SONS, *Malay.*—R. L. MOND, J.P.

H.C.—MRS. A. GWYNNE-HOWELL, *Sicilian Buttercup.*—J. H. HOUGHTON.

CLASS 49.—COCK AND HEN OF ANY PURE BREED, BEST MATED TO PRODUCE TABLE POULTRY. [4 entries.]

I. (£1.)—J. H. BAKER AND SON, *Indian and Dorking.*

II. (15s.)—NORTHCOTT AND SON, *Indian Game and Dorking.*

R.—W. HAMBLY, *Indian Game and Dorking.*

H.C.—MISS C. STEPHENS.

SELLING CLASSES.

CLASS 50.—ANY DISTINCT BREED, COCK OR COCKEREL (PRICE NOT TO EXCEED £1 1s.). [19 entries.]

I. (£1.)—S. W. THOMAS, *Brahma.*

II. (15s.)—S. W. THOMAS, *French.*

III. (10s.)—CAPTAIN M. DE BATHE, *Blue Orpington.*

R.—A. HOLDEN.

V.H.C.—W. TAYLOR, *Indian Game.*

H.C.—MRS. K. M. MOTT, *Orpington.*

C.—THOMAS BROS., *Orpington.*

CLASS 51.—ANY DISTINCT BREED, HEN OR PULLET (PRICE NOT TO EXCEED £1 1s.). [11 entries.]

I. (£1.)—CARNE BROS., *Orpington.*

II. (15s.)—A. HOLDEN.

III. (10s.)—T. H. FURNESS.

R.—G. PONTING, *Orpington.*

V.H.C.—E. LONGDEN, *Malay.*

H.C.—W. T. JENKIN, *Indian Game.*

C.—J. JEFFREYS, *Leghorn.*

CHICKENS OF 1914.

CLASS 52.—COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAN, SUSSEX OR DORKING, COCKEREL. [8 entries.]

I. (£1.)—LORD ROTHSCHILD, *Sussex.*

II. (15s.)—S. W. THOMAS, *Blue Orpington,* 3½ months.

III. (10s.)—CARNE BROS., *Orpington,* January 3.

R.—A. J. FALKENSTEIN, *Sussex,* January 9.

V.H.C.—J. M. CHANDLER, *Barred Rock,* January 2.

H.C.—W. A. JUKES, *Orpington,* January 11.

C.—A. C. MAJOR, *Dorking,* January 2.

CLASS 53.—COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAN, SUSSEX OR DORKING, PULLET. [14 entries.]

I. (£1.)—J. T. BROWN, *Orpington,* January 6.

II. (15s.)—A. J. FALKENSTEIN, *Sussex,* January 9.

III. (10s.)—MRS. E. CALLARD, January 2.

R.—LORD ROTHSCHILD, *Sussex.*

V.H.C.—A. C. MAJOR, *Dorking,* January 2.

H.C.—W. A. JUKES, *Orpington,* January 11.

C.—CARNE BROS., *Orpington,* January 3.

CLASS 54.—MINORCA, WYANDOTTE, LEGHORN, HAMBURG, FAVEROLLES, OR FRENCH, COCKEREL. [8 entries.]

I. (£1.)—MRS. E. CALLARD, January 2.

II. (15s.)—B. NANCARROW, *Wyandotte.*

III. (10s.)—T. H. FURNESS, *Wyandotte,* January 6.

R.—E. LL. SIMON, *Leghorn,* January 2.

V.H.C.—J. WILLIAMS, *Leghorn,* January 17.

CLASS 55.—MINORCA, WYANDOTTE, LEGHORN, HAMBURG, FAVEROLLES OR FRENCH, PULLET. [8 entries.]

I. (£1.)—J. WHARTON, *Wyandotte*, January 1.

II. (15s.)—MRS. E. CALLARD, January 2.

III. (10s.)—H. GUNN, *Wyandotte*, January 1.

R.—B. NANCARROW, *Wyandotte*.

CLASS 56.—GAME, MALAY, (OR ANY OTHER DISTINCT BREED (NOT PREVIOUSLY MENTIONED), COCKEREL. [11 entries.]

I. (£1.)—W. S. JENKIN, *Indian Game*, January 3.

II. (15s.)—J. H. BAKER AND SON, *Indian*.

III. (10s.)—A. HOLDEN, *Indian Game*, January 2.

R.—MRS. DOBSON GUNN, *Rhode Island Red*.

V.H.C.—H. A. LUXTON, *Indian Game*, January 2.,

H.C.—MISS C. STEPHENS, *Rhode Island Red*, January 2.

CLASS 57.—GAME, MALAY, OR ANY OTHER DISTINCT BREED (NOT PREVIOUSLY MENTIONED). PULLET. [10 entries.]

I. (£1.)—COUNTESS OF CRAVEN.

II. (15s.)—J. H. BAKER AND SON, *Indian*.

III. (10s.)—A. HOLDEN, *Indian Game*, January 2.

R.—W. T. JENKIN, *Indian Game*, January 3.

V.H.C.—H. A. LUXTON, *Indian Game*, January 2.

LIVE TABLE POULTRY.

CLASS 58.—PAIR OF COCKERELS OF ANY PURE BREED, HATCHED IN 1914. [3 entries.]

I. (£1.)—A. C. MAJOR, *Dorkings*, January 2.

II. (15s.)—S. F. EDGE, *Sussex*.

R.—LORD ROTHSCHILD, *Sussex*.

CLASS 59.—PAIR OF PULLETS OF ANY PURE BREED, HATCHED IN 1914. [7 entries.]

I. (£1.)—J. H. BAKER AND SONS, *Indian*.

II. (15s.)—A. C. MAJOR, *Dorkings*, January 2.

III. (10s.)—H. A. LUXTON, *Indian Game*, Januarv 2.

R.—B. NANCARROW, *White Dotte*.

V.H.C.—S. F. EDGE, *Sussex*.

H.C.—LORD ROTHSCHILD, *Sussex*.

CLASS 60.—PAIR OF CROSS-BRED COCKERELS, HATCHED IN 1914.
[5 entries.]

I. (**£1.**)—MRS. MERRYWEATHER, *Faverolles-Indian Game*, January 2.

II. (**15s.**)—LADY FITZGERALD, *Game-Orpington Wyandotte*, January 3.

R.—LORD ROTHSCHILD, *Sussex-Dorking*.

V.H.C. -R. C. P. BRADSHAW, *Indian Game-Buff Orpington*, January .

CLASS 61. -PAIR OF CROSS-BRED PULLETS, HATCHED IN 1914.
[4 entries.]

I. (**£1.**)—MRS. MERRYWEATHER, *Faverolles-Indian Game*, January 2.

II. (**15s.**)—LORD ROTHSCHILD, *Sussex-Dorking*.

R.—LADY FITZGERALD, *Game-Orpington Wyandotte*, January 3.

V.H.C.—W. HAMBLY, February 5.

SPECIAL PRIZES.

Given by the Poultry Club.

A Gold Medal for the best Cock in the Poultry Classes, the property of a member of the Poultry Club. **I.**—C. WATSON.

A Gold Medal for the best Hen in the Poultry Classes, the property of a member of the Poultry Club. **I.**—G. H. PROCTER.

A Gold Medal for the best Cockerel in the Poultry Classes, the property of a member of the Poultry Club. **I.**—MRS. E. CALLARD.

A Gold Medal for the best Pullet in the Poultry Classes, the property of a member of the Poultry Club. **I.**—THE COUNTESS OF CRAVEN.

DUCKS, GEESE AND TURKEYS.

CLASS 62.—DRAKE OR DUCK (AYLESBURY). [3 entries.]

I. (**£1.**)—MRS. W. H. PALMER.

II. (**15s.**)—A. F. ROWE.

CLASS 63.—DRAKE OR DUCK (ROUEN). [2 entries.]

I. (**£1.**)—R. ANTHONY.

R.—E. N. MORRIS.

CLASS 64.—DRAKE OR DUCK (PEKIN). [3 entries.]

I. (**£1.**)—R. ANTHONY.

II. (**15s.**)—R. C. P. BRADSHAW.

R.—MRS. W. F. SNELL.

CLASS 65.—GANDER OR GOOSE. [5 entries.]

I. (£1.)—MRS. W. H. PALMER.
II. (15s.)—MRS. W. F. SNELL.
R.—MRS. W. F. SNELL.
V.H.C.—ABBOT BROS.
H.C.—T. DAVIES.

CLASS 66.—TURKEY, COCK OR HEN. [6 entries.]

I. (£1.)—M. LINDNER.
II. (15s.)—LADY FITZGERALD.
III. (10s.)—MRS. W. F. SNELL.
R.—J. H. FOWLER.
V.H.C.—ABBOT BROS.

DEAD TABLE POULTRY.

(Forwarded killed and plucked.)

CLASS 67.—PAIR OF COCKERELS OF 1914 OF ANY PURE BREED. [4 entries.]

I. (£1.)—LORD ROTHSCHILD, *Sussex.*
II. (15s.)—F. H. WHEELER, *Sussex*, January.
R.—F. H. WHEELER, *Orpington*, January.
V.H.C.—S. F. EDGE, *Sussex*, January 3.

CLASS 68.—PAIR OF PULLETS OF 1914 OF ANY PURE BREED. [5 entries.]

I. (£1.)—F. H. WHEELER, *Orpington*, January.
II. (15s.)—LORD ROTHSCHILD, *Sussex.*
R.—S. F. EDGE, *Sussex*, January.
V.H.C.—W. T. JENKIN, *Indian Game*, January 3.
H.C.—F. H. WHEELER, *Sussex*, January.

CLASS 69.—PAIR OF CROSS-BRED COCKERELS OF 1914. [5 entries.]

I. (£1.)—MRS. MERRYWEATHER, *Orpington-Indian Game*, January 2.
II. (15s.)—LORD ROTHSCHILD, *Sussex-Dorking.*
R.—F. H. WHEELER, *Sussex-Faverolle*, January.
V.H.C.—F. H. WHEELER, *Sussex-Orpington*, January.

CLASS 70.—PAIR OF CROSS-BRED PULLETS. [5 entries.]

I. (**£1.**)—LORD ROTHSCHILD, *Sussex-Dorking.*

II. (**15s.**)—F. H. WHEELER, *Sussex-Faverolle,* January.

R.—MRS. MERRYWEATHER, *Orpington-Indian Game,* January 2.

V.H.C.—LADY FITZGERALD, *Game-Orpington Wyandotte,* January 3.

H.C.—F. H. WHEELER, *Sussex-Orpington,* January.

CLASS 71.—PAIR OF DUCKLINGS OF 1914.
1st Prize, £1 ; 2nd Prize, 15s. ; 3rd Prize, 10s.
[NO ENTRY.]

FORESTRY.

CLASS 1.—FOR A GENERAL COLLECTION OF EXHIBITS ILLUSTRATIVE OF FORESTRY. [3 entries.]

I. (Gold Medal.)—EARL STANHOPE, Chevening, Sevenoaks, Kent.

II. (Silver Medal.)—MISS E. C. TALBOT, Margam Park, Port Talbot.

III. (Bronze Medal.)—EARL OF CAWDOR, Golden Grove Estate, Carmarthenshire.

CLASS 2.—FOR BOARDS OF SCOTS PINE (*Pinus sylvestris*). [5 entries.]

I. (Silver Medal.)—EARL OF CARNARVON, Highclere Castle, Newbury.

II. (Bronze Medal.)—EARL STANHOPE, Chevening, Sevenoaks, Kent.

CLASS 3.—FOR BOARDS OF LARCH (*Larix europen*). [4 entries.]

I. (Silver Medal.)—EARL STANHOPE, Chevening, Sevenoaks, Kent.

II. (Bronze Medal.)—MISS E. C. TALBOT, Margam Park, Port Talbot.

CLASS 4.—FOR BOARDS OF NORWAY SPRUCE (*Picea excelsa*). [4 entries.]

I. (Silver Medal.)—LLANOVER ESTATE TRUSTEES, Westgate Chambers, Newport, Mon.

II. (Bronze Medal.)—EARL OF CARNARVON, Highclere Castle, Newbury.

H.C.—EARL OF CAWDOR, Golden Grove Estate, Carmarthenshire.

CLASS 5.—FOR BOARDS OF ASH (*Fraxinus Excelsior*), OAK (*Quercus robur*), AND ELM (*Ulmus Campestris*). [2 entries.]

I. (Silver Medal.)—EARL OF CAWDOR, Golden Grove Estate, Carmarthenshire.

II. (Bronze Medal.)—MISS E. C. TALBOT, Margam Park, Port Talbot.

CLASS 6.—FOR BOARDS OF THREE NON-CONIFEROUS TIMBERS OTHER THAN THE ABOVE. [1 entry.]

1st Prize, a Silver Medal; 2nd Prize, a Bronze Medal.

[NO AWARD.]

CLASS 7.—FOR A 9-FEET FIELD GATE, MANUFACTURED UPON AN ESTATE FROM HOME-GROWN TIMBER, SHOWN IN WORKING ORDER. THE WOOD NOT BEING DRESSED WITH A PRESERVATIVE, CREOSOTED OR PAINTED. [2 entries.]

I. (Silver Medal.)—EARL OF CAWDOR, Golden Grove Estate, Carmarthenshire.

II. (Bronze Medal.)—MISS E. C. TALBOT, Margam Park, Port Talbot.

CLASS 8.—FOR EXHIBITS ILLUSTRATIVE OF FORESTRY CONTRIBUTED BY INSTITUTIONS OR BY ESTATES NOT DESIROUS OF ENTERING IN COMPETITIVE CLASSES. [3 entries.]

H.C.—NATIONAL FRUIT AND CIDER INSTITUTE, Long Ashton, Bristol.

H.C.—THE DIRECTOR, ROYAL BOTANIC GARDENS, KEW, SURREY.

C.—DAME E. F. SMYTH, Ashton Court, Bristol.

CLASS 9.—FOR EXAMPLES OF CREOSOTING BY PRESSURE OR ABSORPTION, AND OF OTHER METHODS OF PRESERVATION. [1 entry.]

I. (Silver Medal.)—MISS E. C. TALBOT, Margam Park. Port Talbot.

Bath and West and Southern Counties Society.

OBJECTS OF THE SOCIETY AND PRIVILEGES OF MEMBERSHIP.

ANNUAL EXHIBITIONS.

THE Society annually holds an Exhibition in some city or town in England or Wales. Each section of the Society's district is visited at intervals, so that most Members have an opportunity of seeing the Show in their own neighbourhood every few years. Prizes to a large amount are given for Horses, Cattle, Sheep, Pigs, Farm Produce, &c. Provision is also made for the exhibition of Agricultural Implements and Machinery, Seeds, Cattle Foods, Artificial Manures, and articles of general utility. A substantially built and completely equipped Working-Dairy on a large scale is a special feature of these Exhibitions. Here explanatory demonstrations, and comparative tests of implements and processes are carried on with the assistance of well-known practical and scientific experts, and Butter-making Competitions are held. Among the features of the Annual Meeting are Shoeing, Milking and other Competitions, Poultry and Horticultural Shows, and Exhibitions illustrative of Bee-keeping, Home Industries, Art-Manufactures, Nature Study and Forestry.

Membership entitles to free admission to the Annual Exhibition, and also to the Grand Stand overlooking the Horse and Cattle Ring, to the Reserved Seats in the Working Dairy, and to the use of the Members' Special Pavilion for Luncheons, Reading, Writing, &c.

Entries can be made by Members (elected on or before the last Tuesday in January preceding the Show) at half the Fees payable by Non-Members.

THE JOURNAL.

All Members receive free of charge the Society's Journal, which is published annually bound in cloth. It has for its aim the dissemination of agricultural knowledge in a popular form, and in addition to original articles by well-known agricultural authorities, it contains particulars of the Society's general operations, full reports of its experimental and research work, prize awards, financial statements, lists of Members, reviews of new books on agriculture, &c. (The price of the *Journal* to non-Members is 6s. 4d. post free.)

CHEMICAL AND OTHER FACILITIES.

The Society has a Consulting Chemist, *from whom Members can obtain analyses and reports at reduced rates of charge.* An arrangement has also been made under which Members of the Society can obtain, free of charge, from the National Fruit and Cider Institute at Long Ashton, analyses of cider-apples and perry-pears, and with a view to assisting farmers and others in dealing with insect and other pests which affect agriculture, horticulture, &c., the Council have availed themselves of an offer from the Board of Economic Biology of the University of Bristol, to investigate the nature of any insect or other pest and report upon it free of charge

EXPERIMENTS.

Experiments on crops are conducted at experimental stations in various parts of the Kingdom, and *Members are enabled to take part in these and to receive reports thereon.*

ART-MANUFACTURES, NATURE STUDY, FORESTRY, &c.

One of the objects for which the Society was founded was the encouragement of Arts as well as Agriculture, and, to this end, exhibitions are held of Art-Manufactures and of work representative of Arts and Handicrafts. Exhibitions are also held illustrating Nature Study, as a branch of Education: the Science of Forestry, &c.

TERMS OF MEMBERSHIP.

ANNUAL SUBSCRIPTIONS.

Governors, not less than	£2
Ordinary Members, not less than	£1
Tenant Farmers, the rateable value of whose holdings does not exceed £200 a-year, not less than	10s.

Governors who are eligible for election as President, or Vice-President, are entitled, in addition to the privileges already mentioned, to an extra Season Ticket for the Annual Exhibition and to the Grand Stand, &c. Governors subscribing more than £2 are entitled to a further Ticket for every additional £1 subscribed.

Members subscribing less than £1 are entitled to all the privileges of Membership except that of entering Stock at reduced fees, and their admission Ticket for the Annual Show is available for *one day only* instead of for the whole time of the Exhibition.

LIFE COMPOSITIONS.

Governors may compound for their Subscription for future years by payment, in advance, of £20; and Members by payment, in advance, of £10. Governors and Members who have subscribed for twenty years may become Life Members on payment of half these amounts.

Any person desirous of joining the Society can be proposed by a Member, or by

THOS. F. PLOWMAN,

Secretary and Editor,

3, Pierrepont Street, Bath.

Telegraphic Address—" PLOWMAN, BATH."

Telephone No. 610.

Bath and West and Southern Counties Society.

GENERAL LAWS.

As revised in accordance with the Report of a Special Committee; which Report was received and adopted by the Annual General Meeting of Members, held on May 30, 1895.

COMPOSITION OF THE SOCIETY.

I. The Society shall consist of a President, Vice-Presidents, Trustees, Council, Treasurer, Secretary, and Members.

OBJECTS.

II. The Society shall have the following objects:—

a. To hold Exhibitions of breeding stock, agricultural implements, and such other articles connected with agriculture, arts, manufactures or commerce, as may be determined upon by the Council.

b. To conduct practical and scientific investigations in agriculture.

c. To promote technical education in agriculture by providing means of systematic instruction.

d. To publish a Journal for circulation.

SUBSCRIPTIONS.

III. The Annual Subscription for Members shall be as follows:—

Governors (who are eligible for election as President or Vice-President), not less than	£2
Ordinary Members, not less than	£1
Tenant Farmers (the rateable value of whose holdings does not exceed £200 a-year), not less than	10*s.*

IV. The payment of £20 in one sum shall constitute a Governor for life, and of £10 in one sum an Ordinary Member for life; but any Governor who has subscribed not less than £2 annually for a period of twenty years may become a Life Governor on the further payment of £10 in one sum; and any Ordinary Member, who has subscribed not less than £1 annually for the same period may become a Life-Member on the further payment of £5 in one sum.

V. Subscriptions shall become due and be payable in advance on the 1st of January in each year or as soon as the Subscriber has been elected a Member. When the election takes place during the last quarter of the year the subscription payable on election will be considered as applying to the ensuing year.

VI. A Member shall be liable to pay his subscription for the current year unless he shall have given notice, in writing, to the Secretary before January 1st of his intention to withdraw.

GOVERNING BODY.

VII. The entire management of the Society—including the making of Bye-laws, election of Members, determining the Prizes to be awarded, appointing Committees, fixing the Places of Meetings and Exhibitions, appointing or removing the Treasurer, Secretary, and such other officers as may be required to carry on the business of the Society—shall be vested in the Council, who shall report its proceedings at the Annual Meetings of the Society.

VIII. The Council shall consist of the Patron (if any), President, Vice-Presidents, Trustees, and Treasurer (who shall be *ex-officio* Members), and of sixty-six elected Members.

ELECTION OF PRESIDENT, VICE-PRESIDENTS, TRUSTEES, AND COUNCIL.

IX. The election of a President for the year, of any additional Vice-Presidents or Trustees, and of the Members of Council representing the Divisions named in Law X., shall take place at the Annual Meeting of the Society, and they shall enter into office at the conclusion of the Exhibition during which such Annual Meeting has been held.

X. The sixty-six Members of the Council referred to in Laws VIII. and IX. shall consist of fifty-eight persons residing or representing property in the following Divisions, viz. :—

Twelve from the Counties of Devon and Cornwall, which shall be called the Western Division ;

Twenty-four from the Counties of Somerset, Dorset, and Wilts, which shall be called the Central Division ;

Twelve from the Counties of Hants, Berks, Oxon, Bucks, Middlesex, Surrey, Sussex, and Kent, which shall be called the Southern Division ; and

Ten from the Counties of Worcester, Gloucester, Hereford and Monmouth, and the Principality of Wales, which shall be called the North-Western Division.

The remaining eight shall be elected (irrespective of locality) from the general body of members, and shall form a Division which shall be called the "Without Reference to District" Division.

XI. One-half of the elected Members in each of the five Divisions named in Law X. shall retire annually by rotation, but shall be eligible for re-election.

XII. The Council shall have power to nominate a President, Vice-Presidents, Trustees, and Members of Council for the approval of the Annual Meeting, and to fill up such vacancies in their own body as are left after the Annual Meeting, or as may from time to time occur during the interval between the Annual Meetings.

XIII. Nominations to offices, election to which is vested in the whole body of Members, must reach the Secretary ten days before the meeting at which such vacancies are to be filled up.

MEETINGS.

XIV. The Annual Meeting of the Society shall take place during the holding of the annual Exhibition.

XV. Special General Meetings of the Society may be convened by the President on the written requisition of not less than three Members of Council; and all Members shall have ten days' notice of the object for which they are called together.

XVI. No Member of less than three months' standing, or whose subscription is in arrear, shall be entitled to vote at a Meeting.

EXHIBITIONS.

XVII. The Annual Exhibitions of the Society shall be held in different Cities or Towns in successive years.

XVIII. All Exhibitors shall pay such fees as may be fixed by the Council. Members subscribing not less than £1 per annum, who have been elected previous to February 1st, and have paid the subscription for the current year, shall be entitled to exhibit at such reduction in these fees as the Council shall determine.

PRIZES.

XIX. All prizes offered at the cost of the Society shall be open for competition to the United Kingdom.

XX. No person intending to compete for any prize offered at the annual Exhibition shall be eligible to act as a judge or to have any voice in the selection of judges to award the premiums in the department in which he exhibits.

XXI. If it be proved to the satisfaction of the Council that any person has attempted to gain a prize in this, or in any other society, by a false certificate or by a misrepresentation of any kind, such person shall thereupon be, for the future, excluded from exhibiting in this Society.

JOURNAL.

XXII. The Proceedings of the Society, Awards of Prizes, Financial Statements and Lists of Officers, Governors, and Members, shall be printed annually in the Society's *Journal*, and every Governor and Member, not in arrear with his subscription, shall be entitled to receive one copy, free of expense, and there shall be an additional number printed for sale.

POLITICS.

XXIII. No subject or question of a political tendency shall be introduced at any Meeting of this Society.

ALTERATIONS IN LAWS.

XXIV. No new General Law shall be made or existing one altered, added to or rescinded, except at an Annual or Special General Meeting, and then only provided that a statement of particulars, in writing, shall have been sent to the Secretary at least twenty-one days previous to the Meeting at which the question is to be considered.

List of Officers,

1914-1915.

WORCESTER MEETING.

PATRON.

HIS MOST GRACIOUS MAJESTY THE KING.

PRESIDENT FOR 1914-1915.

THE RIGHT HON. THE EARL OF COVENTRY.

TRUSTEES.

*Bath, The Marquis of, Longleat, Warminster.
Acland, Sir C. T. D., Bart., Killerton, Exeter.
Edwards, C. L. F., The Court, Axbridge, Somerset.

VICE-PRESIDENTS.

Acland, Sir C. T. D., Bart.	Killerton, Exeter
Allen, J. D.	Springfield House, Shepton Mallet
Badcock, H. J.	Broadlands, Taunton
*Bath, Marquis of	Longleat, Warminster
*Beaufort, Duke of	Badminton, Chippenham
Benyon, J. Herbert	Englefield House, Reading
*Bute, The Marquis of	The Castle, Cardiff
*Clinton, Lord	Heanton Satchville, Dolton, N. Devon
*Devonshire, Duke of	Chatsworth, Derbyshire
*Digby, Lord	Minterne, Cerne Abbas
*Ducie, Earl of	Tortworth, Falfield, R.S.O.
Edwards, C. L. F.	The Court, Axbridge, Somerset
*Falmouth, Viscount	Tregothnan, Truro
Fitzhardinge, Lord	Cranford, Hounslow
Gibbons, G.	Tunley Farm, nr. Bath
Hambleden, Viscount	Greenlands, Henley-on-Thames
Hobhouse, Right Hon. H.	Hadspen House, Castle Cary
*Jersey, Earl of	Middleton Park, Bicester, Oxon
*Lansdowne, Marquis of, K.G.	Bowood, Calne
*Llewelyn, Sir J. T. D., Bart.	Penllergaer, Swansea
Moreton, Lord	Sarsden House, Chipping Norton
*Mount-Edgcumbe, Earl of	Mount Edgcumbe, Devonport
Neville-Grenville, R.	Butleigh Court, Glastonbury

*** Those to whose names an asterisk (*) is prefixed have filled the office of President.

VICE-PRESIDENTS—*continued.*

NORTHUMBERLAND, DUKE OF . .	Albury Park, Guildford
*PLYMOUTH, EARL OF	Hewell Grange, Bromsgrove
*PORTMAN, VISCOUNT	Bryanston, Blandford
*RADNOR, EARL OF	Longford Castle, Salisbury
SHELLEY, SIR J., Bart. . . .	Shobrooke Park, Crediton
SOMERSET, DUKE OF	Maiden Bradley, Bath
STRACHIE, LORD	Sutton Court, Pensford, Somerset
WALERAN, LORD	Bradfield, Cullompton

THE LORD WARDEN OF THE STANNARIES.

THE SECRETARY AND KEEPER OF THE RECORDS OF THE DUCHY OF CORNWALL.

THE RECEIVER-GENERAL OF THE DUCHY OF CORNWALL.

*** Those to whose names an asterisk (*) is prefixed have filled the office of President.

MEMBERS OF COUNCIL.

EX-OFFICIO MEMBERS.

THE PATRON.
THE PRESIDENT.
THE VICE-PRESIDENTS.
THE TRUSTEES.
THE TREASURER.

ELECTED MEMBERS.

WESTERN DIVISION (DEVON AND CORNWALL).

(12 *Representatives.*)

***Elected in* 1913**

Name.	*Address.*
BOSCAWEN, Rev. A. T.	Ludgvan Rectory, Long Rock, R.S.O., Cornwall
DAW, J. E.	Exeter
LEVERTON, W.	Woolleigh Barton, Beaford, N. Devon
LOPES, SIR HENRY Y. B., Bart.	Maristow, Roborough, S. Devon
MARTYN G.	Liskeard, Cornwall
SILLIFANT, A. O.	Culm Leigh, Stoke Canon, Exeter

***Elected in* 1914.**

Name.	*Address.*
BAYLY, J.	Highlands, Ivy Bridge, S. Devon
BUCKINGHAM, REV. Preb.	The Rectory, Doddiscombsleigh, Exeter
GIBBS, A. H.	Pytte, Clyst St. George, Topsham, Devon
MOORE-STEVENS, COL. R. A.	Winscott, Torrington, Devon
SHELLEY, J. F.	Posbury House, Crediton
STUDDY, T. E.	Mazonet, Stoke Gabriel Totnes

CENTRAL DIVISION (SOMERSET, DORSET, AND WILTS).

(24 *Representatives.*)

CLARK, W. H.	Rutland Cottage, Combe Down, Bath
FARWELL, E. W.	11, Laura Place, Bath
GORDON, G. H.	The Barn House, Sherborne, Dorset
HILL, V. T.	Mendip Lodge, Langford, Bristol
HOARE, SIR H. H. A., Bart.	Stourhead, Zeals, S.O., Wilts
HUBLE, J. C.,	Brislington Hill, Bristol
KNIGHT, S. J.	Walnut Farm, East Dundry, Bristol
RAWLENCE, E. A.	Newlands, Salisbury
RAWLENCE, G. N.	7, Moberley Road, Salisbury
SOMERVILLE, A. F.	Dinder House, Wells
WHITE, A. R.	Charnage, Mere, Wilts
COLES, CARY	Manor House, Winterbourne Stoke, Salisbury
GIBSON, J. T.	Claverham, Yatton
MAULE, M. ST. J.	Chapel House, Bath
NAPIER, H. B.	Long Ashton, Clifton Bristol
NICHOLS, G.	49, Broad Street, Bristol
PARRY-OKEDEN, LT.-COL. U. E. P.	Turnworth, Blandford, Dorset
SANDERS, R. A., M.P.	Barwick House, Yeovil
SHERSTON, MAJOR C. D.	Evercreech, Bath
SKRINE, COL. H. M.	Warleigh Manor, Bath
STORRAR, J. I.	Grittleton, Chippenham
TUDWAY, C. C.	The Cedars, Wells, Somt
WYNFORD, LORD	Warmwell, Dorchester

SOUTHERN DIVISION (HANTS, BERKS, OXON, BUCKS, MIDDLESEX, SURREY, SUSSEX AND KENT).

(12 *Representatives.*)

ASHCROFT, W.	13, The Waldrons, Croydon
COBB, H. M.	Higham, Kent
CUNDALL, H. M., I.S.O., F.S.A.	4, Marchmont Gardens, Richmond, Surrey
DRUMMOND, H. W.	3, Bryanston Square, London, W.
LLEWELLYN, L. T. E.	Hackwood, Basingstoke
BEST, CAPT. T. G.	East Carleton Manor Norwich
BYNG, COL. HON. C.	Deerhurst Lyndhurst, Hants
JERVOISE, F. H. T.	Herriard Park, Basingstoke
LATHAM, T.	Dorchester, Oxon
RUTHERFORD, J. A.	Highclere Estate Office Newbury
SUTTON, E. P. F.	Sidmouth Grange, nr. Reading

NORTH-WESTERN DIVISION (WORCESTERSHIRE, GLOUCESTERSHIRE, HEREFORDSHIRE, MONMOUTHSHIRE AND WALES).

(10 *Representatives.*)

ALEXANDER, D.	Cardiff
ALEXANDER, H. G.	5, High Street, Cardiff
BAKER, G. E. LLOYD	Hardwicke Court, Gloucester
BATHURST, C., M.P.	Lydney Park, Gloucester
DRUMMOND, Col. F. D. W.	Cawdor Estate Office, Carmarthen
ALLSEBROOK, A	Link Elm, Malvern Lin
BEST, CAPT. W.	Vivod, Llangollen
COTTERELL, SIR J., Bart.	Garnons, Hereford
LIPSCOMB, G.	Margam Park Estat Office, Port Talbot
MASON, F. F.	Swansea

WITHOUT REFERENCE TO DISTRICT DIVISION.

(8 *Representatives.*)

ACKERS, C. P.	Huntley Manor, Gloucester
EVANS, H. M. G.	Plassissa, Llangennech, Carmarthen
LEE, MAJ.-GEN. H. H.	The Mount, Dinas Powis, Cardiff
WILLIAMS, JESTYN	Llanover Estate, Newport, Mon.
KNOLLYS, C. R.	Weekley, Kettering

STANDING COMMITTEES, 1914-1915.

[The PRESIDENT is *ex-officio* Member of all Committees.]

ALLOTMENT.

EDWARDS, C. L. F., *Chairman.*

BATH, MARQUIS OF
BEST, CAPT. W.
BYNG, COL. HON. C.
GIBBONS, G.
NAPIER, H. B.
STUDDY, T. E.
WYNFORD, LORD

CONTRACTS.

NAPIER, H. B., *Chairman.*

ALLSEBBROOK, A.
BATH, MARQUIS OF
BEST, CAPT. W.
DAW, J. E.
EDWARDS, C. L. F.
MASON, F. F.
NEVILLE-GRENVILLE, R.
STUDDY, T. E.

DAIRY

ACLAND, SIR C. T. D., Bart., *Chairman.*

SOMERVILLE, A. F., *Vice-Chairman.*

ALLEN, J. D.
ASHCROFT, W.
BOSCAWEN, REV. A. T.
CLARK, W. H.
GIBBONS, G.
GIBSON, J. T.
HURLE, J. COOKE
KNOLLYS, C. R.
LATHAM, T.
LLEWELLYN, L. T. E.
NAPIER, H. B.
NEVILLE-GRENVILLE, R.
STORRAR, J. I.
STRACHIE LORD
TUDWAY, C. C.

DISQUALIFYING.

THE STEWARDS OF LIVE STOCK AND PRODUCE.

EXPERIMENTS AND EDUCATION.

ACLAND, SIR C. T. D., Bart., *Chairman.*

ALLEN, J. D.
ASHCROFT, W.
BAKER, G. E. LLOYD
BATHURST, C., M.P.
BENYON, J. H.
GIBBONS, G.
GIBSON, J. T.
HOBHOUSE, RT. Hon. H.
HURLE, J. COOKE
KNOLLYS, C. R.
LATHAM, T.
NEVILLE-GRENVILLE, R.
RAWLENCE, E. A.
RUTHERFORD, J. A.
SOMERVILLE, A. F.

(With power to add to their number.)

FINANCE.

NAPIER, H. B., *Chairman.*

DAW, J. E.
GIBBS, A. H.

FORESTRY.

LIPSCOMB, G., *Chairman.*

ACKERS, C. P.
ACLAND, SIR C. T. D., Bart.
CLINTON, LORD
DRUMMOND, COL. F. D. W.
DUCHESNE. M. C.
EVANS, H. M. G.
NAPIER, H. B.
NORTH, G. F.
RUTHERFORD, J. A.

IMPLEMENT REGULATIONS.

SHELLEY, SIR J., Bart., *Chairman*.

ACLAND, SIR C. T. D., Bart.
BATH, MARQUIS OF
BEST, CAPT. W.
EDWARDS, C. L. F.
GIBBONS, G.
MOORE-STEVENS, COL. R. A..
NAPIER, H. B.
NEVILLE-GRENVILLE, R.
STUDDY, T. E.

JOURNAL.

ACLAND, Sir C. T. D., Bart., *Chairman*.

BAKER, G. E. LLOYD
BATHURST C., M.P.
HOBHOUSE, RIGHT Hon. H.

JUDGES' SELECTION.

SILLIFANT, A. O., *Chairman*.

ALEXANDER, D.
ALLEN, J. D.
ASHCROFT, W.
BYNG, COL. HON. C.
GIBBONS, G.
HOARE SIR H. H. A., Bart.
LATHAM, T.
MOORE-STEVENS, COL. R. A.
PARRY-OKEDEN, LIEUT.-COL. U. E. P.
SHELLEY, SIR J., Bart.
WYNFORD, LORD

RAILWAY ARRANGEMENTS AND ADVERTISEMENTS.

ALEXANDER, D.
COVENTRY, EARL OF
DRUMMOND, H. W.
MASON, F. F.
SHELLEY SIR J., Bart.

(With power to add to their number.)

SCIENCE AND ART.

BATH, MARQUIS OF, *Chairman*.

ACLAND, SIR C. T. D., Bart.
CUNDALL, H. M. (I.S.O., F.S.A.)
DAW, J. E.
EVANS, H. M. G.
FARWELL, E. W.
HOBHOUSE, RT. HON. H.
LEGARD, A. G.
LIPSCOMB, G.
LLEWELYN, SIR J. T. D., Bart.
NAPIER, H. B.
RUTHERFORD, J. A.

(With power to add to their number.)

SELECTION.

THE CHAIRMEN OF ALL OTHER COMMITTEES.

SHOW PLACE AND DATE.

CHAIRMEN OF THE ALLOTMENT, CONTRACTS, DAIRY, FINANCE, FORESTRY, IMPLEMENT REGULATIONS, RAILWAY ARRANGEMENTS, SCIENCE AND ART, AND STOCK PRIZE SHEET COMMITTEES.

(With power to add two Local Members to their number.)

STOCK PRIZE SHEET.

SILLIFANT, A. O., *Chairman*.

ALEXANDER, D.
ALEXANDER, H. G.
ALLEN, J. D.
ALLSEBROOK, A.
ASHCROFT, W.
BUCKINGHAM, REV. Preb.
BYNG, COL. HON. C.
CLARK, W. H.
COLES, C.
COTTERELL, SIR J., Bart.
EVANS, H. M. G.
GIBBONS, G.
HOARE, SIR H. H. A., BART.
LATHAM, T.
LEVERTON, W.
MOORE-STEVENS, Col. R. A.
SHELLEY, SIR J., Bart.
WHITE, A. R.
WILLIAMS, JESTYN
WYNFORD, LORD

WORKS.

EDWARDS, C. L. F., *Chairman.*

BATH, MARQUIS OF
BEST, CAPT. W.
NAPIER, H. B.
STUDDY, T. E.

Stewards.

Cattle, Sheep and Pigs.

BYNG, COL. HON. C.
ASHCROFT, W.
MOORE-STEVENS, COL. R. A.

Cider.

FARWELL, E. W.

Dairy.

GIBBONS, G. SOMERVILLE, A. F.

Experiments.

ASHCROFT, W.

Finance.

NAPIER, H. B. DAW, J. E.
GIBBS, A. H.

Forestry.

LIPSCOMB, G.

Horses.

ALEXANDER, D.
WYNFORD, LORD

Horticulture.

BOSCAWEN, REV. A. T.

Manufactures and Music.

CUNDALL, H. M. (I.S.O., F.S.A.)

Poultry.

STUDDY, T. E.

Shoeing.

LATHAM, T.

Yard.

EDWARDS, C. L. F.
BEST, CAPT. W.
BATH, MARQUIS OF
STUDDY, T. E.

Other Honorary Officials.

Treasurer—LUTTRELL, C. M. F.

Chaplain.

BOSCAWEN, REV. A. T.

Permanent Officials.

Secretary and Editor—PLOWMAN, THOMAS F.

Associate Editor.

LLOYD, F. J. (F.C.S.)

Auditor.

GOODMAN, F. C. (*Chartered Accountant*)

Consulting Chemist.

VOELCKER, DR. J. A. (M.A., F.I.C.)

Veterinary Inspector.

PENBERTHY, Prof. J. (F.R.C.V.S.)

Superintendent of Works.

AYRE, H. C.

Annual Exhibitions.

Year.	Place Visited.	Local Subscription.	Prizes.			Total Local Contribution.	President.	Admissions.		
			Local Committee.	Local Societies.	Local Residents.			On 2/6 Days.	On 1/- Days.	Total.
		£	£	£	£	£				
1852	Taunton	210	..	..	..	210	Lord Portman	..	..	..
1853	Plymouth	450	..	..	..	450	Sir T. D. Acland, Bart.	..	..	..
1854	Bath	450	..	..	..	450	William Miles, M.P.	..	..	..
1855	Tiverton	450	..	..	..	450	Earl Fortescue	..	..	..
1856	Yeovil	450	..	..	..	450	C. A. Moody, M.P.	..	..	..
1857	Newton Abbot	700	..	..	..	700	Lord Courtenay	..	..	..
1858	Cardiff	800	..	..	..	800	Lord Courtenay	..	..	..
1859	Barnstaple	800	85	..	81	966	John Sillifant	..	..	..
1860	Dorchester	900	..	..	..	900	Lord Rivers	10,709	11,949	22,658
1861	Truro	900	..	..	..	900	J. W. Buller, M.P.	15,201	14,220	29,421
1862	Wells	900	..	..	..	900	Sir T. D. Acland, Bart.	10,578	4,775	15,353
1863	Exeter	900	..	..	..	900	Marquis of Bath	15,635	19,284	34,919
1864	Bristol	1000	106	..	50	1156	Earl Fortescue	22,377	65,678	88,055
1865	Hereford	900	358	..	..	1258	Lord Taunton	16,575	35,261	51,836
1866	Salisbury	900 }	57	..	..	957	{ Earl of Portsmouth	7,288	18,737	26,025
1867	Salisbury	.. }					{ J. Tremayne	7,502	16,702	24,204
1868	Falmouth	900	..	..	..	900	Sir J. T. B. Duckworth, Bart.	11,393	19,495	30,888
1869	Southampton	900	132	..	18	1050	Earl of Carnarvon	15,340	41,290	56,630
1870	Taunton	900	..	..	..	900	Sir S. H. Northcote, Bart., C.B., M.P.	17,952	33,653	51,605
1871	Guildford	900	110	..	..	1010	Earl of Cork	10,656	23,406	34,062
1872	Dorchester	800	..	..	10	810	Duke of Marlborough, K.G.	12,791	21,517	34,308
1873	Plymouth	800	..	400	..	1200	Earl of Mount-Edgcumbe.	16,665	45,744	62,409
1874	Bristol	800	403	..	..	1203	Sir Massey Lopes, Bart., M.P.	37,329	72,791	110,120
1875	Croydon	800	245	..	..	1045	R. Benyon, M.P.	14,518	26,028	40,546
1876	Hereford	800	381	..	..	1181	Earl of Ducie	16,396	32,645	49,041
1877	Bath	800	215	..	..	1015	Marquis of Lansdowne	27,625	48,852	76,477
1878	Oxford	800	..	170	6	976	Earl of Jersey	12,414	26,995	39,409

ANNUAL EXHIBITIONS—*continued.*

Year.	Place Visited.	Local Subscription.	Prizes. Local Committee.	Prizes. Local Societies	Prizes. Local Residents.	Total Local Contribution.	President.	Admissions. On 5/- Day.	Admissions. On 2/6 Days.	Admissions. On 1/- Days.	Admissions. Total.
		£	£	£	£	£					
1879	Exeter	800	..	..	10	810	Earl of Morley	..	14,634	40,533	55,167
1880	Worcester	800	..	254	..	1054	Earl of Coventry	..	8,415	37,675	46,090
1881	Tunbridge Wells	800	245	34	..	1079	Marquis of Abergavenny	..	13,368	33,236	46,604
1882	Cardiff	800	200	198	17	1215	Lord Tredegar	..	23,941	38,680	62,621
1883	Bridgwater	800	78	..	..	878	Lord Brooke, M.P.	..	17,171	31,241	48,412
1884	Maidstone	800	310	33	75	1218	Viscount Holmesdale	..	13,501	31,053	44,554
1885	Brighton	800	227	33	82	1142	Viscount Hampden	..	9,637	39,851	49,488
1886	Bristol	800	525	..	..	1325	Lord Carlingford	..	29,580	70,999	100,579
1887	Dorchester	800	..	112	..	912	Earl of Ilchester	..	8,860	29,846	38,706
1888	Newport (Mon.)	800	100	..	..	900	Lord Tredegar	..	14,878	38,567	53,445
1889	Exeter	800	..	..	10	810	Lord Clinton	..	16,405	36,195	52,600
1890	Rochester	800	294	..	26	1120	Earl of Darnley	..	3,480	48,314	51,794
1891	Bath	800	50	103	100	1053	Earl Temple	..	23,510	52,185	75,695
1892	Swansea	800	200	100	10	1110	Sir J. D. T. Llewelyn, Bart.	..	18,364	54,609	72,973
1893	Gloucester	800	400	..	..	1200	Lord Fitzhardinge	..	14,272	40,368	54,640
1894	Guildford	800	174	..	10	984	Earl of Onslow	..	8,671	29,813	38,484
1895	Taunton	800	85	160	10	1055	Viscount Portman	..	13,181	30,111	43,292
1896	St. Albans	800	152	..	..	952	Earl of Clarendon	..	12,056	22,380	34,436
1897	Southampton	800	50	..	..	850	Lord Montagu of Beaulieu	..	8,284	33,750	42,034
1898	Cardiff	800	200	..	..	1000	Lord Windsor	..	13,101	42,501	55,602
1899	Exeter	800	..	225	5	1030	Lord Clinton	..	16,091	39,832	55,923
1900	Bath	800	100	150	10	1060	Marquis of Bath	954	11,601	36,814	49,369
1901	Croydon	800	115	..	..	915	H.R.H. The Duke of Cornwall and York, K.G.	1,196	9,362	30,693	41,251
1902	Plymouth	800	105	100	36	1041	Earl of Morley	842	12,629	40,565	54,036
1903	Bristol	800	434	50	61	1345	Duke of Beaufort	..	34,528	74,352	108,880
1904	Swansea	800	350	..	..	1150	Lord Windsor	..	28,265	50,562	78,827

ANNUAL EXHIBITIONS—*continued.*

Year.	Place Visited.	Local Subscription.	Prizes.			Total Local Contribution.	President.	Admissions.			
			Local Committee.	Local Societies.	Local Residents.			On 5/- Day.	On 2/6 Days.	On 1/- Days.	Total.
		£	£	£	£	£					
1905	Nottingham .	800	..	218	..	1018	Duke of Portland, K.G. . .	..	8,913	45,964	54,877
1906	Swindon .	800	..	200	50	1050	Earl of Radnor . . .	..	7,838	42,013	49,851
1907	Newport (Mon.)	800	201	51	29	1081	H.R.H. The Prince of Wales, K.G.	..	16,236	37,819	54,055
1908	Dorchester .	800	100	25	..	925	Lord Digby . . .	..	12,227	20,350	32,577
1909	Exeter . .	800	..	100	..	900	Lord Clinton	..	14,898	41,891	56,789
1910	Rochester and Chatham .	800	117	..	..	917	Earl of Darnley . . .	..	5,892	20,105	25,997
1911	Cardiff . .	800	195	110	10	1115	Marquis of Bute . . .	..	16,213	40,588	56,801
1912	Bath . .	800	100	100	..	1000	Marquis of Bath . . .	..	13,843	40,935	54,788
1913	Truro . .	800	35	115	39	918	Viscount Falmouth . .	..	12,918	44,700	57,618
1914	Swansea .	800	301	..	..	1101	Sir J. T. D. Llewelyn, Bart. .	..	17,957	67,805	85,762
1915	Worcester .						The Earl of Coventry . .				

Members' Privileges.

ANALYSES OF FERTILISERS, FEEDING STUFFS, WATERS, SOILS, &c.

Applicable only to the case of Persons who are not commercially engaged in the manufacture or sale of any substance sent for Analysis).

Members of the Bath and West and Southern Counties Society, who may also be Members of other Agricultural Societies, are particularly requested in applying for Analyses, to state that they do so as Members of the first-named Society.

THE following are the rates of Charges for Chemical Analyses to Members of the Society.

These privileges are applicable only when the analyses are for *bona-fide* agricultural purposes, and are required by Members of the Society for their own use and guidance in respect of farms or land in their own occupation and within the United Kingdom

The analyses are given on the understanding that they are required for the individual and sole benefit of the Member applying for them, and must not be used for other persons, or for commercial purposes.

Land or estate agents, bailiffs, and others, when forwarding samples are required to state the names of those Members on whose behalf they apply.

Members are also allowed to send for analysis under these privileges any manures or feeding-stuffs to be used by their outgoing tenants, or which are to be given free of cost to their occupying tenants.

The analyses and reports may not be communicated to either vendor or manufacturer, except in cases of dispute.

Members are requested, when applying for an analysis, to quote the number in the subjoined schedule under which they wish it to be made.

No.		
1.	—An opinion of the purity of bone-dust or oil-cake (each sample)	2*s.* 6*d.*
2.	—An analysis of sulphate or muriate of ammonia, or of nitrate of soda, together with an opinion as to whether it be worth the price charged	5*s.*
3.	—An analysis of guano, showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts and ammonia, together with an opinion as to whether it be worth the price charged	10*s.*
4.	—An analysis of mineral superphosphate of lime for soluble phosphates only, together with an opinion as to whether it be worth the price charged	5*s.*
5.	—An analysis of superphosphate of lime, dissolved bones, &c., showing the proportions of moisture, organic matter, sand, soluble and insoluble phosphates, sulphate of lime, and ammonia, together with an opinion as to whether it be worth the price charged	10*s.*
6.	—An analysis of bone-dust, basic slag, or any other ordinary artificial manure, together with an opinion as to whether it be worth the price charged	10*s.*
7.	—An analysis of compound artificial manures, animal products, refuse substances used for manure, &c.	from 10*s.* to £1
8.	—An analysis of limestone, showing the proportion of lime	7*s.* 6*d.*
9.	—An analysis of limestone, showing the proportion of lime and magnesia ..	10*s.*
10.	—An analysis of limestone or marls, showing the proportion of carbonate, phosphate, and sulphate of lime and magnesia, with sand and clay	10*s.*
11.	—Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime	£1
12.	—Complete analysis of a soil	£3
13.	—An analysis of oil-cake or other substance used for feeding purposes, showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre as well as of starch, gum, and sugar in the aggregate; and an opinion of its feeding and fattening or milk-producing properties..	10*s.*
14.	—Analysis of any vegetable product	10*s.*
15.	—Determination of the "hardness" of a sample of water before and after boiling	5*s.*
16.	—Analysis of water of land-drainage, and of water used for irrigation	£1
17.	—Analysis of water used for domestic purposes	£1 10*s.*
18.	—An analysis of milk (to assist Members in the management of their Dairies and Herds, *bona-fide* for their own information and not for trade purposes, nor for use in connection with the Sale of Food and Drugs Acts)	5*s.*
19.	—Personal consultation with the Consulting Chemist. (To prevent disappointment it is suggested that Members desiring to hold a consultation with the Consulting Chemist should write to make an appointment)	5*s.*
20.	—Consultation by letter	5*s.*
21.	—Consultation necessitating the writing of three or more letters	10*s.*

Members wishing to exercise their privileges on the above-named terms, should forward their samples for examination *by post or parcel prepaid*, to the Consulting Chemist, DR. JOHN AUGUSTUS VOELCKER, M.A., F.I.C., Stuart House, 1, Tudor Street, London, E.C.

The fees for analysis must be sent to the Consulting Chemist at the time of application.

GUIDE TO PURCHASERS OF FERTILISERS AND FEEDING STUFFS.

Purchasers are recommended in every case to insist upon having an *Invoice* given to them. This invoice should set out clearly :—

In the case of **Fertilisers**—
(1.) the **name** of the fertiliser ;
(2.) whether the fertiliser be artificially **compounded** or not ;
(3.) the **analysis** guaranteed in respect of the principal fertilising ingredients.

In the case of **Feeding-Stuffs**—
(1.) the **name** of the article :
(2.) the **description** of the article ; whether it has been made from one substance or seed only, or from more than one.
(3.) the **analysis** guaranteed in respect of Oil and Albuminoids.

(NOTE.—The use of the terms "Linseed-cake," "Cotton-cake," &c., implies that these cakes shall be "pure," and purchasers are recommended to insist upon these terms being used without any qualification such as "95 per cent.," "as imported," &c. "Oil-cake" should be avoided.

Members of the Society should see that the **Invoices** agree accurately with the orders given by them, and, in giving these orders, they should stipulate that the goods come up to the guarantees set out in the following list, and that they be sold **subject to the analysis and report of the Consulting Chemist of the Bath and West and Southern Counties Society.**

FERTILISERS.

Raw Bones, Bone-meal, or **Bone-dust** to be guaranteed "PURE," and to contain not less than 45 per cent. of Phosphate of Lime, and not less than 4 per cent. of Ammonia.

Steamed or "**Degelatinised**" **Bones** to be guaranteed "PURE," and to contain not less than 55 per cent. of Phosphate of Lime, and not less than 1 per cent. of Ammonia.

Mineral Superphosphate of Lime to be guaranteed to contain a certain percentage of "Soluble Phosphate." [From 25 to 28 per cent. of Soluble Phosphate is an ordinarily good quality.]

Dissolved Bones to be guaranteed to be "made from raw bone and acid only," and to be sold as containing stated percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia.

Compound Artificial Manures, Bone Manures, Bone Compounds, &c., to be sold by analysis stating the percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia contained.

Basic Slag to be guaranteed to contain a certain percentage of Phosphoric Acid, and to be sufficiently finely ground that 80 to 90 per cent. passes through a sieve having 10,000 meshes to the square inch.

Peruvian Guano to be described by that name, and to be sold by analysis stating the percentages of Phosphates and Ammonia.

Sulphate of Ammonia to be guaranteed to be "PURE," and to contain not less than 24 per cent. of Ammonia.

Nitrate of Soda to be guaranteed to be "PURE," and to contain 95 per cent. of Nitrate of Soda.

Kainit to be guaranteed to contain 23 per cent of Sulphate of Potash.

All fertilisers to be delivered in good and suitable condition for sowing.

FEEDING-STUFFS.

Linseed Cake, Cotton Cake (Decorticated and Undecorticated), and **Rape Cake** (for feeding purposes) to be pure, i.e., prepared *only* from one kind of seed from which their name is derived, and to be in sound condition. The report of the Consulting Chemist of the Bath and West and Southern Counties Society to be conclusive as to the "purity" or otherwise of any feeding-stuffs. The percentages of Oil and Albuminoids must also be guaranteed.

Mixed Feeding Cakes, Meals, &c., to be sold on a guaranteed analysis.

All Feeding-Stuffs to be sold in sound condition, and to contain nothing of an injurious nature or worthless for feeding purposes.

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

GENERAL RULES.

1.—A sample taken for analysis should be fairly *representative of the bulk* from which it has been drawn.

2.—The sample should reach the Analyst *in the same condition* as it was at the time when drawn.

FERTILISERS.

When **Fertilisers** are delivered in bags, select four or five of these from the bulk, and either turn them out on a floor and rapidly mix their contents, or else drive a shovel into each bag and draw out from as near the centre as possible a couple of shovelfuls of the manure, and mix these quickly on a floor.

Halve the heap obtained in either of these ways, take one-half (rejecting the other) and mix again rapidly, flattening down with the shovel any lumps that appear. Repeat this operation until at last only some three or four pounds are left.

From this fill three tins, holding from ½ lb. to 1 lb. each, mark, fasten up and seal each of these. Send one for analysis, and retain the others for reference.

Or,—the manure may be put into glass bottles provided with well-fitting corks; the bottles should be labelled and the corks sealed down. The sample sent for analysis can be packed in a wooden box and sent by post or rail.

When manures are delivered in bulk, portions should be successively drawn from *different parts* of the bulk, the heap being turned over now and again. The portions drawn should be thoroughly mixed, sub-divided, and, finally, samples should be taken as before, except that when the manure is coarse and bulky it is advisable to send larger samples than when it is in a finely-divided condition.

FEEDING-STUFFS.

Linseed, Cotton, and other Feeding Cakes.—If a single cake be taken three strips should be broken off right across the cake and from the middle portion of it, one piece to be sent for analysis, and the other two retained for reference. Each of the three pieces should be marked, wrapped in paper, fastened up and sealed. The piece forwarded for analysis can be sent by post or rail.

A more satisfactory plan is to select four to six cakes from different parts of the delivery, then break off a piece about four inches wide from the middle of each cake, and pass these pieces through a cake-breaker. The broken cake should then be well mixed, and three samples of about 1 lb. each should be taken and put in tins or bags duly marked, fastened, and sealed as before. One of these lots

should be sent for anaylsis, the remaining two being kept for reference. It is advisable, also, with the broken pieces, to send a small strip from an unbroken cake.

Feeding Meals, Grain, &c.—Handfuls should be drawn from the centre of half-a-dozen different bags of the delivery; these lots should then be well mixed. and three ½ lb. tins or bags filled from the heap, each being marked, fastened up, and sealed. One sample is to be forwarded for analysis and the others retained for reference.

SOILS, WATERS, &c.

Soils.—Have a wooden box made, 6 inches in length and width, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil and its subsoil 9 to 12 inches deep; trim this block to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up gently, turn over the box, nail on the lid, and send by rail. The soil will then be received in the position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil and forced down by pressure, and then dug out.

Waters.—Samples of water are best sent in glass-stoppered Winchester bottles holding half a gallon. One such bottle is sufficient for a single sample. Care should be taken to have these scrupulously clean. In taking a sample of water for analysis it is advisable to reject the first portion drawn or pumped, so as to obtain a sample of the water when in ordinary flow. The bottle should be rinsed out with the water that is to be analysed, and it should be filled nearly to the top. The stopper should be secured with string, or be tied over with linen or soft leather. The sample can then be sent carefully packed either in a wooden box with sawdust, &c., or in a hamper with straw.

Milk.—A pint bottle should be sent in a wooden box.

GENERAL INSTRUCTIONS.

Time for Taking Samples.—All samples, both of fertilisers and feeding-stuffs, should be taken as soon after their delivery as possible, and should reach the Analyst within *ten days* after delivery of the article. In every case it is advisable that the Analyst's certificate be received before a fertiliser is sown or a feeding-stuff is given to stock.

Procedure in the event of the Vendor wishing Fresh Samples to be Drawn.—Should a purchaser find that the Analyst's certificate shows a fertiliser or feeding-stuff not to come up to the guarantee given him, he may inform the vendor of the result and complain accordingly. He should then send to the vendor *one* of the two samples which he has kept for reference. If, however, the vendor should demand that a fresh sample be drawn, the purchaser must allow this, and also give the vendor an opportunity of being present, either in person or through a representative whom he may appoint. In that case, three samples should be taken in the presence of both parties with the same precautions as before described, *each* of which should be duly packed up, labelled and *sealed* by both parties. One of these is to be given to the vendor, one is to be sent to the Analyst, and the third is to be kept by the purchaser for reference or future analysis if necessary.

All samples intended for the Consulting Chemist of the Society should be addressed (postage or carriage prepaid) to Dr. J. AUGUSTUS VOELCKER, M.A., F.I.C., Stuart House, 1, Tudor Street, New Bridge Street, London, E.C. Separate letters of instruction should be sent at the same time.

LIST OF JUDGES—WORCESTER, 1915.

HORSES.

Agricultural.—F. W. Griffin, Boro Fen, Peterboro'.
Hunters.—Hon. C. B. Portman, Goldicote, Stratford-on-Avon.
Ponies.—J. Hill, Mowbray Lodge, Church Stretton.
Harness, Saddle and Jumping.—G. Gordon, The Barn House, Sherborne, Dorset.

CATTLE.

Devon.—L. H. Alford, Horridge, Ashford, Barnstaple.
South Devon.—T. W. Luscombe, Stancombe, Totnes.
Shorthorn and Dairy.—W. H. Hitch, Cowley, near Cheltenham.
Hereford.—J. H. Yeomans, Withington, Hereford.
Sussex.—W. Massie, Mulgrave Estate Office, Lythe, Whitby.
Aberdeen-Angus.—C. W Schroeter, Tedfold, Billinghurst, Sussex.
Jersey Bulls.—W. Arkwright, Sutton Hall, Chesterfield.
Jersey Cows and Heifers.—J. H. Shore, Whatley Combe, near Frome, Somerset.
Guernsey.—J. D. T. Parsons, 9, Manor Road, Rusthall, Tunbridge Wells.
Kerry and Dexter.—Colonel W. Stallard, St. John's House, Worcester.

SHEEP.

Shropshire.—A. Mansell, College Hill, Shrewsbury.
Devon Longwoolled.—W. Greenway, Manor Farm, Halse, Taunton.
South Devon.—W. H. Pain, High House, Kingsbridge, Devon.
Kent or Romney Marsh.—H. M. Cobb, Higham, Rochester.
Southdowns.—H. Penfold, La Bagtelle, The Grove, Backheath, S.E.
Hampshire Down.—P. C. Tory Shapwick, Blandford, Dorset.
Oxford Down.—W. D. Little, Middleton Stoney, Bicester, Oxon.
Dorset Horn.—C. Hawkins, Waddon, Dorchester.
Dorset Down.—W. C. Bartlett, Durweston, Blandford, Dorset.
Ryeland.—E. Smith, 111, Bransford Road, Worcester.
Kerry Hill.—F. E. Beavan, The Graig, near Knighton, Rads.

PIGS.

Berkshire.—J. Fricker, Suddon Grange, Wincanton.
Large Black.—J. H. Glover, Cornwood, South Devon.
Large and Middle White and Tamworth.—Colonel F. A. Walker-Jones, The Manor House, Burton, Westmoreland.

PRODUCE.

Cider.—J. Ettle, F.R.H.S., 37 Stanley Grove, Weston-super-Mare.
Cheese.—W. H. Allen, The Grange, Shepton Mallet.
Cream Cheese, Butter and Cream.—D. T. Neagle, 23, Whatley Road, Clifton, Bristol.

COMPETITIONS.

Butter-Making.—D. T. Neagle, 23, Whatley Road, Clifton, Bristol; and H. Bailis Tucker, Fir Lodge, Bloomfield Gardens, Bath.
Milking.—R J. Hoskins, Beard Hill Farm, Shepton Mallet.

MONEY PRIZES.

					PAGE
Horses	£848	0	0	..	ciii
Cattle	1,182	0	0	..	cviii
Sheep	627	0	0	..	cxiii
Pigs	217	0	0	..	cxv
Cider	30	0	0	..	cxvi
Cheese	69	0	0	..	cxvii
Cream Cheese, Butter and Cream	67	10	0	..	cxvii
Butter-Making	73	10	0	..	cxvii
Milking	11	5	0	..	cxviii
	£3,125	5	0		

DONORS OF MONEY PRIZES.

Bath and West and Southern Counties Society	£2,562	5	0
Herefordshire and Worcestershire Agricultural Society	257	0	0
Shire Horse Society (or Medal)	15	0	0
Devon Cattle Breeders' Society	10	0	0
Shorthorn Society	20	0	0
Dairy Shorthorn (Coates's Herd Book) Association	10	0	0
Hereford Herd Book Society	20	0	0
English Aberdeen-Angus Cattle Association	10	0	0
English Guernsey Cattle Society	10	0	0
English Kerry and Dexter Cattle Society	15	0	0
Shropshire Sheep Breeders' Association and Flock Book Society	15	0	0
Kent or Romney Marsh Sheep Breeders' Association	17	0	0
Southdown Sheep Society	17	0	0
Hampshire Down Sheep Breeders' Association	10	0	0
Oxford Down Sheep Breeders' Association	10	0	0
Dorset Horn Sheep Breeders' Association	15	0	0
Dorset Down Sheep Breeders' Association	15	0	0
Ryeland Flock Book Society	15	0	0
Kerry Hill (Wales) Flock Book Society	20	0	0
British Berkshire Society	5	0	0
Large Black Pig Society	12	0	0
Worcestershire County Council	15	0	0
Herefordshire County Council	15	0	0
Gloucestershire County Council	15	0	0
	£3,125	5	0

DONORS OF MEDALS, PLATE, &c.

Shire Horse Society.
Hunters' Improvement and National Light Horse Breeding Society.
National Pony Society.
Hackney Horse Society.
Chas. A. Hanson, Esq.
Sussex Herd Book Society.
Aberdeen Angus Cattle Society.
English Aberdeen-Angus Cattle Association.
English Kerry and Dexter Cattle Society.
Southdown Sheep Society.
Bath and West Society.

PRIZES

	First Prize.	Second Prize.	Third Prize
An Animal can be entered in as many Classes as it is eligible for on payment of an additional fee in each Class. No additional fee is, however, payable in the case of those Prizes headed as Champion or Special Prizes.	£	£	£

HORSES.

Exhibitors are requested to note that Animals entered in Classes 1 to 7 must be in the Yard before 8 a.m. on Thursday, May 20th, and (except the Stallions in Classes 5 and 6 which can be removed after the Parade of Horses on the third day of the Show) must remain in the Yard till 6 o'clock on Tuesday, May 25th.

SHIRE.

(Registered or eligible for registration in the Shire Horse Society's Stud Book.)

Class	First Prize £	Second Prize £	Third Prize £
1.—Mare in-Foal, or with foal at foot	15	10	3
2.—Filly or Gelding, foaled in 1914	10	5	3
3.—Filly or Gelding, foaled in 1913	10	5	3
4.—Filly or Gelding, foaled in 1912	10	5	3
5.—Stallion, foaled before 1913	15	10	3
6.—Stallion, foaled in 1913	15	10	3
7.—Colt, foaled in 1914	15	10	3

	First Prize.	Second Prize.	Thrd Prize
## HORSES—*continued.*	£	£	£
MEDAL.			
(Offered by the Shire Horse Society.)			
A Gold Medal, or the sum of £10, for the Best Mare or Filly in the Shire Horse Classes, under Condition 47,	10		
and to the Breeder of the winner under the Conditions stated, a prize of	5		
SPECIAL PRIZES.			
(Offered by the Herefordshire and Worcestershire Agricultural Society, and open only to residents in the Counties of Hereford and Worcester, who are members of that Society.)			
Best Local Exhibits in Class 1	5	2	
Best Local Exhibits in Class 2	5	2	
Best Local Exhibits in Class 3	5	2	
Best Local Exhibits in Class 4	5	2	
Best Local Exhibits in Class 5	5	2	
Best Local Exhibits in Class 6	5	2	
Best Local Exhibits in Class 7	5	2	
HUNTERS.			
Animals entered in Classes 8 to 15 must be in the Yard before 8 a.m. on Thursday, May 20th, and must remain there till 4 p.m on Saturday, May 22nd, when they must be removed from the Yard.			
CLASS			
8.—MARE in-Foal, or with foal at foot	15	10	3
9.—FILLY, COLT or GELDING, foaled in 1914 . . .	10	5	3
10.—FILLY, COLT or GELDING, foaled in 1913 . . .	10	5	3
11.—FILLY or GELDING, foaled in 1912	10	5	3
12.—MARE or GELDING, foaled in 1911	10	5	3
13.—MARE or GELDING, foaled before 1912, to carry under 14 stone	20	10	3
14.—MARE or GELDING, foaled before 1912, to carry 14 stone or over	20	10	3
15.—MARE or GELDING, foaled before 1912, that has not won a Prize of £10 or over under Saddle at any Show held previous to April 2, 1915 . . .	10	5	3
SPECIAL PRIZES.			
(Offered by the Herefordshire and Worcestershire Agricultural Society, and open only to residents in the Counties of Hereford and Worcester, who are members of that Society.)			
Best Local Exhibit in Class 8	5		
Best Local Exhibit in Class 9	5		
Best Local Exhibit in Class 10	5		
Best Local Exhibit in Class 11	5		
Best Local Exhibit in Class 13 or 14	5		
Best Local Exhibit in Class 15	5		

HORSES—*continued.*

	First Prize.	Second Prize.	Third Prize
	£	£	£

MEDALS.

(Offered by the Hunters' Improvement and National Light Horse Breeding Society, under Conditions 48 and 49.)

A Gold Medal, or £5 and a Bronze Medal, for the best Hunter Brood Mare in Class 8, registered with a number in the Hunter Stud Book at the time of entry or within a month of the award, not having previously won the above-named Society's Gold Medal as a Brood Mare in 1915, and which must have her foal at foot, or produce a living foal in 1915 to a thoroughbred horse or Registered Hunter sire. In the second instance a certificate to that effect must be forwarded before the Medal is sent.

A Silver Medal or £1 (at the option of the winner), for the Best Hunter Mare or Gelding of any age, exhibited by a member of the Hunters' Improvement and National Light Horse Breeding Society, whose subscription to that Society must be paid within a month of the award.

Only Prize-winners in the Classes will be eligible for these Medals.

PONIES.

Animals entered in Classes 16 to 20 must be brought into the Yard after 6 p.m. on Saturday, May 22nd, and before 8 a.m. on Monday, May 24th, and must remain in the Yard until 6 p.m. on Tuesday, May 25th.

Class	First Prize. £	Second Prize. £	Third Prize £
16.—Mare, not exceeding 14.2 hands, suitable to breed Polo or Riding Ponies, in-foal, or with foal at foot .	8	4	2
17.—Mare, not exceeding 13.2 hands	8	4	2
18.—Filly, Colt or Gelding, foaled in 1913, not exceeding 14.2 hands	8	4	2
19.—Filly, Colt or Gelding, foaled in 1912, not exceeding 14.2 hands	8	4	2
20.—Stallion, not exceeding 15 hands, suitable to get Polo or Riding Ponies	8	4	2

MEDALS.

(Offered by the National Pony Society.)

A Silver Medal for the best Polo Pony Brood Mare in the Brood Mare Class, registered or eligible for registration in the Stud Book.

HORSES—*continued.*

A Silver Medal for the best Polo Pony Stallion, registered or eligible for registration in the Stud Book; or best Polo Pony Entire Colt, one, two or three years old, entered or eligible for the Supplement, viz., out of a Registered or Entered Dam.

A Bronze Medal for the best Foal, entered or eligible for the Supplement, viz., out of a Registered or Entered Dam.

(These Medals are offered subject to Condition No. 51.)

HARNESS AND SADDLE.

ENTRIES CLOSE { With boxes—March 26, or at double fees April 2. Without Boxes—May 1.

Horses entered in other Classes can, if eligible, be also entered on payment of an additional fee, in the Harness and Saddle Classes.

Horses entered in the Harness and Saddle Classes only and not having a box in the Yard, must be in the Show Yard by 1 p.m. on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as the class has been judged.

Class	First Prize. £	Second Prize. £	Third Prize £
21.—Mare or Gelding, not over 14.2 hands, to be driven in harness on the 1st day of Show	10	5	2
22.—Covert or Lady's Mare or Gelding, any height, for riding purposes, to be shown in saddle on the 1st day of Show	10	5	2
23.—Mare or Gelding, 15 hands or over, to be driven in harness on the 2nd day of Show	10	5	2
24.—Pony, not exceeding 13.2 hands, suitable for, and to be ridden by, a child not over 14 years of age, on the 2nd day of Show	5	3	1
25.—Mare or Gelding, over 14.2 and under 15 hands, to be driven in harness on the 3rd day of Show .	10	5	2
26.—Trotting. Best Mare, Stallion, or Gelding, under 15 hands, for speed, to be driven in harness on the 3rd day of Show	10	5	2
27.—Team of Two Horses with Waggon, the property of a Farmer, to be shown in harness on the 4th day of Show	10	5	2
28.—Cart Mare or Gelding, the property of a Farmer or Tradesman, driven regularly by himself or his servants for a period of not less than 3 months prior to the date of the Show. To be shown in trade cart on the 4th day of Show	5	2	1
29.—Light Mare or Gelding ditto ditto .	5	2	1

HORSES—*continued.*

Class	First Prize. £	Second Prize. £	Third Prize £
30.—Mare or Gelding, not over 13.2 hands, to be driven in harness on the 5th day of Show	10	5	2
31.—Trotting. Best Mare, Stallion or Gelding, 15 hands or over, for speed, to be driven in harness on the 5th day of Show	10	5	2

MEDAL.

(Offered by the Hackney Horse Society.)

A Silver Medal for the best Mare or Gelding exhibited in Single Harness in Classes 21 to 31, subject to Conditions 50.

JUMPING.

The Society reserves the right to cancel the Classes for Jumping in the event of sufficient entries not being forthcoming. In such case notice will be given to Exhibitors, and Entry Fees paid will be returned.

(For Regulations as to Jumping Classes see Conditions 52.)

ENTRIES CLOSE { With Boxes—March 26, or at double fees April 2. Without Boxes—May 1.

Horses can be entered in as many Jumping Classes as they are eligible for on payment of the entry for each Class, and can take Second or Third Prize in each Class, but only one first prize in Classes 32 to 37 and 39, or in Classes 38 and 40. In the event of an Animal which has already won a First Prize in the aforesaid Classes being again placed first, the animal next in point of merit will, if eligible succeed to the First Prize, and the Stewards reserve the right to amend the Awards correspondingly, and, if necessary, to proportionately reduce the amounts paid to the other Prize Winners in the Class. The award to two or more exhibits of an equal First will not debar such Animals from taking a First Prize in a later class.

Horses entered in the Jumping Classes only, and not having a box in the Yard, must be in the Show Yard by 1 p.m. on the day on which they compete and, with the consent of the Stewards, may leave the Yard as soon as the Class has been judged.

Class	First Prize. £	Second Prize. £	Third Prize £
32.—Mare or Gelding, 15 hands and over, that shall jump over the course in the best form on the 1st day of Show	10	5	2
33.—Mare or Gelding, under 15 hands, ditto, ditto .	10	5	2
34.—Mare or Gelding, 15.3 hands and over, that shall jump over the course in the best form on the 2nd day of Show	10	5	2
35.—Mare or Gelding, under 15.3 hands, ditto, ditto .	10	5	2
36.—Mare or Gelding, 15 hands and over, that shall jump over the course in the best form on the 3rd day of Show	10	5	2

HORSES—*continued.*

Class	First Prize.	Second Prize.	Third Prize
	£	£	£
37.—MARE or GELDING, under 15 hands, that shall jump over the course in the best form on the 3rd day of Show	10	5	2
38.—MARE or GELDING, that shall jump highest on the 4th day of Show	10	5	2
39.—MARE or GELDING, any height, that shall jump over the course in the best form on the 4th day of Show	10	5	2
40.—MARE or GELDING, that shall jump highest on the 5th day of Show	10	5	2
CHAMPION CLASS.			
41.—MARE or GELDING, any height, having won a Prize in Classes 32 to 40, that shall jump over the course in the best form on the 5th day of Show	15	5	

(In this Class the whole of the Jumps will be raised at the discretion of the Stewards.)

The Entry Fee will be returned in the case of Horses entered in Class 41, but afterwards found to be ineligible.

CATTLE.

DEVON.

(£10 towards the Prizes in Classes 42 to 48 is contributed by the Devon Cattle Breeders' Society.)

Class	First Prize (£)	Second Prize (£)	Third Prize (£)
42.—Cow, in-Milk, calved before 1912	10	5	2
43.—HEIFER, in-Milk, calved in 1912	10	5	2
44.—HEIFER, calved in 1913	10	5	2
45.—HEIFER, calved in 1914	10	5	2
46.—BULL, calved in 1911 or 1912	10	5	2
47.—BULL, calved in 1913	10	5	2
48.—BULL, calved in 1914	10	5	2

SOUTH DEVON.

Class	First Prize (£)	Second Prize (£)	Third Prize (£)
49.—Cow or HEIFER, in-Milk, calved in or before 1912	10	5	2
50.—HEIFER, calved in 1913	10	5	2
51.—HEIFER, calved in 1914	10	5	2
52.—BULL, calved in 1911 or 1912	10	5	2
53.—BULL, calved in 1913	10	5	2
54.—BULL, calved in 1914	10	5	2

CATTLE—*continued.*

	First Prize.	Second Prize.	Third Prize
	£	£	£
SPECIAL PRIZES.			
(Offered by Charles A. Hanson, Esq., Fowey Hall, Cornwall, Alderman of the City of London.)			
A Challenge Cup for the best Cow in Milk, in the South Devon Classes, to be won three times in succession or four times altogether, before becoming the property of the winner.			
(Offered by the South Devon Herd Book Society.)			
A Silver Medal for the best Exhibit in Classes 49 to 51.			
A Silver Medal for the best Exhibit in Classes 52 to 54.			
SHORTHORN.			
(The 1st Prize in Class 55 (and a Silver Medal to the Breeder of the Winner) is offered by the Shorthorn Society, and the 1st Prize in Class 56 by the Dairy Shorthorn (Coates's Herd Book) Association.)			
CLASS			
55.—Pedigree Dairy Cow, in-Milk, four years old and upwards on May 20th, eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society or Association in 1915, to be milked in the ring before judging, under Conditions 61	**10**	5	
56.—Ditto under four years old ditto ditto	**10**	5	
57.—Cow, in-Milk, calved before 1912	10	5	2
58.—HEIFER, in-Milk, calved in 1912	10	5	2
59.—HEIFER, calved in 1913	10	5	2
60.—HEIFER, calved in 1914	10	5	2
61.—BULL, calved in 1911 or 1912	10	5	2
62.—BULL, calved in 1913	10	5	2
63.—BULL, calved in 1914	10	5	2
SPECIAL PRIZES.			
(Offered by the Herefordshire and Worcestershire Agricultural Society, and open only to members of that Society resident in Herefordshire or Worcestershire).			
Best Exhibit in Class 57	**5**		
Best Exhibit in Class 58	**5**		
Best Exhibit in Class 59	**5**		
Best Exhibit in Class 60	**5**		
Best Exhibit in Class 61	**5**		
Best Exhibit in Class 62	**5**		
Best Exhibit in Class 63	**5**		

CATTLE—*continued.*	First Prize.	Second Prize.	Third Prize
	£	£	£
CHAMPION PRIZE.			
(Offered by the Shorthorn Society, with Silver Medal to the Breeder.)			
Best Bull in Classes 61, to 63, entered in, or eligible for entry in, Coates's Herd Book	10		
HEREFORD.			
CLASS			
64.—Cow, in-Milk, calved before 1912	10	5	2
65.—HEIFER, in-Milk, calved in 1912	10	5	2
66.—HEIFER, calved in 1913	10	5	2
67.—HEIFER, calved in 1914	10	5	2
68.—BULL, calved in 1911 or 1912	10	5	2
69.—BULL, calved in 1913	10	5	2
70.—BULL, calved in 1914	10	5	2
The Prizes in Classes 71 to 76 are offered by the Herefordshire and Worcestershire Agricultural Society, and are open only to members of that Society.			
71.—Heifer, calved in 1913 (novice)	**7**	**4**	**2**
72.—Heifer, calved in 1914 (novice)	**7**	**4**	**2**
73.—Bull, Cow, and their Offspring	**10**	**5**	**2**
74.—Bull, calved on or after March 1st, 1914 . .	**10**	**5**	**2**
75.—Bull, calved in 1914 (novice)	**10**	**5**	**2**
76.—Steer, calved in 1914	**7**	**4**	**2**
NOVICE QUALIFICATION.—Exhibitors who have not, within the last 10 years, won a First Prize in the Hereford Cattle Classes at the Royal (Shrewsbury, 1914, excepted), Bath and West and Southern Counties, or the Open Classes at the Herefordshire and Worcestershire Agricultural Society's Shows.			
CHAMPION PRIZES.			
(Offered by the Hereford Herd Book Society.)			
Best Cow or Heifer in Classes 64 to 67 and 71 and 72 .	**10**		
Best Bull in Classes 68 to 70 and 73 to 75 . . .	**10**		
SUSSEX.			
77.—Cow or HEIFER, in-Milk, calved in or before 1912 .	10	5	2
78.—HEIFER, calved in 1913 or 1914	10	5	2
79.—BULL, calved in 1912, 1913 or 1914	10	5	2
CHAMPION PRIZES.			
(Offered by the Sussex Herd Book Society.)			
A Silver Medal for the Best Cow or Heifer, in Class 77 or 78.			
A Silver Medal for the Best Bull in Class 79.			

CATTLE—*continued.*	First Prize.	Second Prize.	Thrd Prize
	£	£	£
ABERDEEN-ANGUS.			
(The 1st Prize in Class 80 is offered by the English Aberdeen-Angus Cattle Association.)			
CLASS			
80.—Cow or HEIFER, in-Milk, calved before 1st Dec., 1912	10	5	2
81.—HEIFER, calved on or after 1st Dec., 1912 . .	10	5	2
82.—HEIFER, calved on or after 1st Dec., 1913 . .	10	5	2
83.—BULL, calved before Dec. 1st, 1913	10	5	2
84.—BULL, calved on or after Dec. 1st, 1913 . . .	10	5	2
CHAMPION PRIZES.			
(Offered by the Aberdeen-Angus Cattle Society.) A Gold Medal, value £10, for the Best Animal in Classes 80 to 84.			
(Offered by the English Aberdeen-Angus-Cattle Association.)			
A Silver Medal for the Best Animal of opposite Sex to that awarded the Gold Medal in Classes 80 to 84.			
JERSEY.			
85.—Cow, in-Milk, calved before 1912	10	5	2
86.—Cow or HEIFER, in-Milk, calved in 1912 . .	10	5	2
87.—HEIFER, in-Milk, calved in or since 1913 . .	10	5	2
88.—HEIFER, calved in 1914	10	5	2
89.—BULL, calved in 1911 or 1912	10	5	2
90.—BULL, calved in 1913	10	5	2
91.—BULL, calved in 1914	10	5	2
GUERNSEY.			
(£10 towards the Prizes in the Guernsey Classes are contributed by the English Guernsey Cattle Society.)			
92.—Cow, in-Milk, calved before 1912	10	5	2
93.—HEIFER, in-Milk, calved in 1912	10	5	2
94.—HEIFER, calved in 1913	10	5	2
95.—HEIFER, calved in 1914	10	5	2
96.—BULL, calved in 1911 or 1912	10	5	2
97.—BULL, calved in 1913	10	5	2
98.—BULL, calved in 1914	10	5	2
KERRY.			
99.—Cow or HEIFER, in-Milk, calved in or before 1912 .	10	5	2
100.—HEIFER, calved in 1913 or 1914	10	5	2
101.—BULL, calved in 1912, 1913 or 1914 . . .	10	5	2

	First Prize	Second Prize.	Third Prize
CATTLE—*continued.*	£	£	£
DEXTER.			
CLASS			
102.—Cow or HEIFER, in-Milk, calved in or before 1912 .	10	5	2
103.—HEIFER, calved in 1913 or 1914	10	5	2
104.—BULL, calved in 1912, 1913 or 1914 . . .	10	5	2
(The Prizes in Class 105 are offered by the English Kerry and Dexter Cattle Society.)			
105.—Bull, calved in 1914, whose sire and dam are entered in the English Kerry and Dexter or Royal Dublin Society's Herd Book	**10**	**3**	**2**
SPECIAL PRIZE.			
(Offered by the English Kerry and Dexter Cattle Society.)			
The Devonshire Challenge Cup, for the Best Animal in Classes 102 to 105, bred by Exhibitor, and entered in or eligible for the English Kerry and Dexter Herd Book. The Cup to be won by the same Exhibitor with different animals three years in succession before becoming his absolute property.			
The Certificate of Award of the English Kerry and Dexter Cattle Society will be given to the owner of the winning animal on each occasion the Cup is competed for.			
DAIRY.			
(*See Regulation* 63.)			
Animals entered in the Breed Classes can, if eligible, be entered also, on payment of the additional fee, in Classes 106 *to* 108.			
The Prizes in Class 106 are offered by the Herefordshire and Worcestershire Agricultural Society, and open only to members of that Society resident in Herefordshire or Worcestershire.			
106.—Dairy Cow of any breed, in-Milk or in-Calf . .	**7**	**4**	**2**
107.—Cow, in-Milk, of any breed or cross, under 950 lbs. live weight, yielding the largest quantity of milk, of normal character, containing at each time of milking 12 per cent. of total solids, of which not less than 3 per cent. shall be fat, the period of lactation being taken into consideration . .	10	5	2
108.—Cow, in-Milk, of any breed or cross, 950 lbs. live weight or over, ditto, ditto	10	5	2

SHEEP.

	First Prize.	Second Prize.	Thrd Prize
	£	£	£
SHROPSHIRE.			
(The Prizes in Class 109 are offered by the Shropshire Sheep Breeders' Association and Flock Book Society.)			
CLASS			
109.—Two Shear Ram	10	3	2
110.—Shearling RAM	10	5	2
111.—Pair of RAM LAMBS, dropped in 1915	10	5	2
112.—Pen of 3 Shearling EWES	10	5	2
(The Prizes in Classes 113 and 114 are offered by the Herefordshire and Worcestershire Agricultural Society, and are open only to members of that Society resident in Herefordshire or Worcestershire.)			
113.—Shearling Ram	7	3	
114.—Pen of 3 Shearling Ewes	7	3	
DEVON LONGWOOLLED.			
115.—Shearling RAM	10	5	2
116.—Pen of three Shearling EWES	10	5	2
SOUTH DEVON.			
117.—Shearling RAM	10	5	2
118.—Pen of Three Shearling EWES	10	5	2
KENT OR ROMNEY MARSH.			
The Prizes in Class 119 are offered by the Kent or Romney Marsh Sheep Breeders' Association.)			
119.—Two Shear Ram	10	5	2
120.—Shearling RAM	10	5	2
121.—Pair of RAM LAMBS, dropped in 1915	10	5	2
122.—Pen of three Shearling EWES	10	5	2
SOUTHDOWN.			
(The Prizes in Class 123 are offered by the Southdown Sheep Society.)			
123.—Two Shear Ram	10	5	2
124.—Shearling RAM	10	5	2
125.—Pair of RAM LAMBS, dropped in 1915	10	5	2
126.—Pen of three Shearling EWES	10	5	2

SHEEP.—*continued.*	First Prize.	Second Prize.	Third Prize
	£	£	£
SPECIAL PRIZES.			
(Offered by the Southdown Sheep Society, under Condition 69.)			
Silver Medal or £1 for the Best Ram or Ram Lamb in Classes 123, 124, and 125.			
Class **HAMPSHIRE DOWN.**			
127.—Shearling Ram	10	5	2
128.—Pair of Ram Lambs, dropped in 1915 . . .	10	5	2
129.—Pen of three Shearling Ewes	10	5	2
(The Prizes in Class 130 are offered by the Hampshire Down Sheep Breeders' Association.)			
130.—Pen of three Ewe Lambs, dropped in 1915 . . .	**7**	**3**	
OXFORD DOWN.			
131.—Shearling Ram	10	5	2
132.—Pair of Ram Lambs, dropped in 1915 . . .	10	5	2
133.—Pen of three Shearling Ewes	10	5	2
(The Prizes in Class 134 are offered by the Oxford Down Sheep Breeders' Association, and will be withheld until the Animals awarded the prizes are registered in the Flock Book.)			
134.—Pair of Ewe Lambs, dropped in 1915 . . .	**6**	**3**	**1**
DORSET HORN.			
135.—Shearling Ram	10	5	2
136.—Pair of Ram Lambs, dropped after Nov. 1, 1914 .	10	5	2
137.—Pen of three Shearling Ewes.	10	5	2
(The Prizes in Class 138 are offered by the Dorset Horn Sheep Breeders' Association.)			
138.—Pen of three Ewe Lambs, dropped after November 1st, 1914	**10**	**3**	**2**
DORSET DOWN.			
(The Prizes in Class 139 are offered by the Dorset Down Sheep Breeders' Association.)			
139.—Shearling Ram	**10**	**3**	**2**
140.—Pair of Ram Lambs, dropped in 1915 . . .	10	5	2
141.—Pen of three Shearling Ewes	10	5	2
RYELAND.			
(The Prizes in Class 142 are offered by the Herefordshire and Worcestershire Society, and are open only to members of that Society.)			
142.—Ram, 2 Shear and upwards	**7**	**3**	

	First Prize.	Second Prize.	Third Prize.
SHEEP.—*continued.*	£	£	£
(£15 towards the Prizes in Classes 143 to 146 are contributed by the Ryeland Flock Book Society.)			
CLASS			
143.—Shearling RAM	10	5	2
144.—Pair of RAM LAMBS, dropped in 1915	5	2	1
145.—Pen of three Shearling EWES	10	5	2
146.—Pair of EWE LAMBS, dropped in 1915	5	2	1
KERRY HILL.			
(Of the Prizes offered in Classes 147 to 150, £10 are contributed by the Herefordshire and Worcestershire Agricultural Society, and £20 by the Kerry Hill (Wales) Flock Book Society.)			
147.—RAM, 2 Shear, and upwards	5	3	2
148.—Shearling RAM	5	3	2
149.—Pen of three EWES that have reared Lambs in 1915	5	3	2
150.—Pen of three Shearling EWES	5	3	2

PIGS.

	First Prize.	Second Prize.	Third Prize.
BERKSHIRE.			
151.—BOAR, farrowed in 1912, 1913 or 1914	7	3	2
152.—Pair of BOARS, farrowed in 1915	5	2	1
153.—Breeding Sow, farrowed before 1915	7	3	2
154.—Pair of Breeding Sows, farrowed in 1915	5	2	1
SPECIAL PRIZE.			
(Offered by the British Berkshire Society.)			
Best Boar or Sow in the Berkshire Classes entered in, or eligible for, the Herd Book, whose Sire and Dam, together with the name of its Breeder, are entered in the Catalogue	5		
LARGE BLACK.			
155.—BOAR, farrowed in 1912, 1913 or 1914	7	3	2
156.—Pair of BOARS, farrowed in 1915	5	2	1
157.—Breeding Sow, farrowed before 1915	7	3	2

PIGS.—*continued.*

(The Prizes in Class 158 are offered by the Large Black Pig Society.)

Class	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.	Fourth Prize. £	s.
158.—Breeding Sow, not exceeding 12 months old on May 1st, 1915	7	0	3	0	2	0		
159.—Pair of Breeding Sows, farrowed in 1915	5	0	2	0	1	0		
LARGE WHITE.								
160.—BOAR, farrowed in 1912, 1913 or 1914	7	0	3	0	2	0		
161.—Pair of BOARS, farrowed in 1915	5	0	2	0	1	0		
162.—Breeding Sow, farrowed before 1915	7	0	3	0	2	0		
163.—Pair of Breeding Sows, farrowed in 1915	5	0	2	0	1	0		
MIDDLE WHITE.								
164.—BOAR, farrowed in 1912, 1913 or 1914	7	0	3	0	2	0		
165.—Pair of BOARS, farrowed in 1915	5	0	2	0	1	0		
166.—Breeding Sow, farrowed before 1915	7	0	3	0	2	0		
167.—Pair of Breeding Sows, farrowed in 1915	5	0	2	0	1	0		
TAMWORTH.								
168.—BOAR, farrowed in 1912, 1913, or 1914	7	0	3	0	2	0		
169.—Pair of BOARS, farrowed in 1915	5	0	2	0	1	0		
170.—Breeding Sow, farrowed before 1915	7	0	3	0	2	0		
171.—Pair of Breeding Sows, farrowed in 1915	5	0	2	0	1	0		

PRODUCE.

CIDER.

(Open to Growers or Makers.)

(The Winners in these Classes can have Gold, Silver or Bronze Medals instead of Money Prizes, should they prefer it.)

Class	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.	Fourth Prize. £	s.
172.—Cask of not less than 18 and not more than 30 gallons of CIDER, made in 1914 of a specific gravity not exceeding 1·015 at 60° Fahr.	3	0	2	0	1	0		
173.—12 Bottles of CIDER, made in 1914, ditto	3	0	2	0	1	0		
174.—Cask of not less than 18 and not more than 30 Gallons of CIDER, made in 1914	3	0	2	0	1	0		
175.—12 Bottles of CIDER, made in 1914	3	0	2	0	1	0		
176.—12 Bottles of CIDER, made in any year previous to 1914	3	0	2	0	1	0		

PRODUCE.—*continued.*

	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.	Fourth Prize. £	s.
CHEESE.								
CLASS								
177.—3 Cheddar CHEESES (not less than 56 lbs. each) made in 1914	10	0	7	0	4	0		
178.—3 Cheddar CHEESES (not over 56 lbs. each) made in 1914	8	0	5	0	3	0		
179.—3 Single Gloucester or Wilts CHEESES made in 1914	6	0	4	0	2	0		
180.—8 Loaf or other Truckle CHEESES made in 1914	5	0	3	0	2	0		
181.—3 Caerphilly CHEESES, made in 1915	5	0	3	0	2	0		
CREAM CHEESE, BUTTER & CREAM.								
(*These Classes are not open to Professional Teachers.*)								
182.—3 Cream or other Soft CHEESES	3	0	2	0	1	0	0	10
183.—3 lbs. of Fresh (or very slightly salted)	4	0	3	0	2	0	1	0
BUTTER	4	0	3	0	2	0	1	0
184.—3 lbs. of Fresh (or very slightly salted) BUTTER, made from scalded cream	4	0	3	0	2	0	1	0
185.—3 lbs. of BUTTER, in the making of which no salt has been used, to be judged on the last day of Show	4	0	3	0	2	0	1	0
186.—Not less than 6 lbs. of Fresh BUTTER packed for transit	3	0	1	10	0	10		
187.—12 lbs. of Keeping BUTTER, in a jar or crock, to be delivered to the Secretary 4 weeks before the Show	4	0	3	0	2	0	1	0
188.—4 half-pounds of Scalded Cream	3	0	2	0	1	0		

COMPETITIONS.

BUTTER-MAKING.

(*No Winner of a first prize given by this Society for Butter-making during the last* 3 *years is eligible to compete in Class* 190 *or* 191.)

(*For Conditions and Regulations see Entry Form.*)

(**The Prizes in Classes 189, 193 and 194 are offered by the Worcestershire County Council, and are open only to Students who have attended the Worcestershire County Dairy School.)**

(**The Prizes in Classes 199 and 200 are offered by the Herefordshire County Council, and in Classes 201 and 202 by the Gloucestershire County Council.)**

BUTTER-MAKING—*continued.*	First Prize. £ s.	Second Prize. £ s.	Third Prize. £ s.	Fourth Prize. £ s.
189.—For Competitors who have not previously won a prize at the Shows of the Bath and West and Southern Counties Society or the Herefordshire and Worcestershire Agricultural Society. On the 1st day of Show	2 0	1 10	1 0	0 10
199.—For Pupils who have received instruction under the Herefordshire County Council and have never won a prize for Butter-making at an Agricultural Show. On the 1st day of Show.	2 0	1 10	1 0	0 10
190.—For first year students who have been through a course of instruction in Butter-making at any County Council School since the Society's last Show. On the 2nd day of Show	4 0	3 0	1 10	1 0
201.—For Gloucestershire County Council Dairy School Students who have never won a County Prize. On the 2nd day of Show	2 0	1 10	1 0	0 10
191.—For Men and Women, on the 3rd day of Show	4 0	3 0	1 10	1 0
200.—For Pupils who have received instruction under the Herefordshire County Council. On the 3rd day of Show.	4 0	3 0	2 0	1 0
202.—For Gloucestershire County Council Dairy School Students. On the 3rd day of Show	4 0	3 0	2 0	1 0
192.—For Men and Women on the 4th day of Show	4 0	3 0	1 10	1 0
193.—For Competitors who have not previously won a Prize at the Shows of the Bath and West and Southern Counties Society or the Herefordshire and Worcestershire Agricultural Society. On the 4th day of Show	2 0	1 10	1 0	0 10
194.—For Winners of Prizes in Classes 189 or 193. or at any Competitions of the Herefordshire and Worcestershire Agricultural Society. On the 5th day of Show	2 0	1 10	1 0	0 10
195.—For Winners of First and Second Prizes in the Butter-making Classes 189 to 194, or at any previous meeting of the Show. On the 5th day of Show. 1st Prize, Gold Medal. 2nd Prize, Silver Medal. 3rd Prize, Bronze Medal.				
MILKING.				
196.—For Men 18 years of age and over	1 10	1 0	0 15	0 10
197.—For Women 18 years of age and over	1 10	1 0	0 15	0 10
198.—For Boys and Girls under 18 years of age	1 10	1 0	0 15	0 10

CONDITIONS AND REGULATIONS FOR LIVE STOCK.

GENERAL.

Entries.

1. The following are the Fees payable for Stock entries made on or before March 26. After that date and up to April 2, entries (except in the Harness, Saddle and Jumping Classes) will only be received on payment, in each case, of double the fee named below. *Exhibitors are requested to note that no exception can be made to this.* The entry fee is not returnable to an Exhibitor who enters an Animal in a Class for which it is ineligible, or for entries that are withdrawn after the date of entry has expired.

	Members. (see Reg. 5 below)		Non-Members.
Horses (see also Reg. 2 below) for each Entry, including Horse Box	15s.	..	30s.
Cattle, Sheep and Pigs for each Entry	10s.	..	20s.

For particulars as to fees in the Produce, Butter-Making and Milking, Classes, see Entry forms.

2. Animals entered in the Harness, Saddle and Jumping Classes, and not having a box in the Yard, must be in the Yard by the time stated on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as they have been judged. Entries in the Harness, Saddle and Jumping Classes, if no Horse Box is required, must reach the Secretary not later than May 1. If a Box is required the entry must reach the Secretary on or before March 26, or, at double fees as stated above, by April 2. The Entry Fees are:—

	Members.		Non-Members.
Harness, Saddle and Jumping, for each Entry (without Box):—			
Classes 24, 28 and 29	2s. 6d.	..	5s.
Other Classes	5s.	..	10s.

3. No Exhibitor can make more than three entries in any one Class of Horses, Cattle, Sheep or Pigs, except in the Harness, Saddle or Jumping Classes.

4. No Entry will be received unless the fee accompanies it, and (if the Exhibitor is a Member of the Society) the subscription for the year, unless previously paid, together with any arrears that may be due.

5. The privilege of entering at Members' fees is strictly limited to members of the Society, or of the Herefordshire and Worcestershire Agricultural Society, elected on or before January 26, 1915, and subscribing not less than £1 annually.

6. Where a Prize is offered for a *pair* or *pen* of Animals, single entry fees only are payable for each *pair* or *pen*, and only one entry form must be used.

7. All Entries must be made on the printed forms to be obtained of the Secretary (Thos. F. Plowman, 3, Pierrepont Street, Bath), and, in applying for Forms, Exhibitors are requested to state how many entries they wish to make of either Horses, Cattle, Sheep or Pigs, as each Stock entry must be made on a separate form.

8. Every Exhibitor or Competitor is requested to carefully examine the List of Prizes and Conditions, as he will be held responsible for the correctness of his Certificate of Entry. An Exhibitor omitting to give information asked for on the

entry form, with regard to the age, breeder, name, colour, sire, dam, &c., of an animal will be liable to have his entry disqualified, and if an exhibitor desires that his animal shall compete for any special prize offered, he must notify this on the entry form where requested to do so.

9. If an Exhibitor or Competitor fails, when called upon by the Stewards or Council, to prove the correctness of his Certificate of Entry to their satisfaction, the Entry may be disqualified, and any award made to it cancelled.

10. An Exhibitor who has made, in due time, an entry of Horses, Cattle, Sheep or Pigs, in a particular class, will be permitted, up to Friday, April 16, to withdraw the entry of such animal, and to substitute for it the entry of another animal in the same class, on payment of the difference, if any, between the amount of the entry fee originally paid for the animal withdrawn, and the post entry fee. When, after entry, an animal dies, the exhibitor will be permitted to substitute another entry for it, in the same class, without payment of any further fee, upon affording evidence of death and furnishing particulars of the substituted entry in time for the alteration to be made in the published catalogue.

11. An animal can be entered in as many Classes as it is eligible for on payment of an additional fee in each Class. No additional fee is, however, payable in the case of Special or Champion Prizes for exhibits already entered in any particular Class.

12. Every exhibit must be the *bona fide* property of the Exhibitor both at the time of entry and on the first day of the Exhibition.

Show Yard.

13. The Yard will be open for the reception of Horses (see Regulation 2 for Harness and Jumping Horses), Cattle, Sheep and Pigs, on Tuesday and Wednesday, May 18 and 19, from 7 A.M. to 6 P.M. Agricultural Horses and Hunters will also be received from 6 to 8 o'clock on the morning of the first day of Show, but all other Stock Entries (except Ponies, which must be in the Yard before 8 a.m. on Monday, May 24), must be in the Yard the previous day. A label denoting the number of each entry will be sent by the Secretary and must be securely affixed to the head of the Animal. The carriage of exhibits must in all cases be paid by the Exhibitor. No exhibit subject to charges will be received by the Officers of the Society.

14. If an animal is brought into the Show Yard without having been entered for exhibition, the owner shall be liable to a fine of £2 and to the forfeiture of any prize awarded to him or her.

15. All Live Stock (see Conditions 2, 13 and 38 for exceptions with regard to Horses) must remain in their places in the Show Yard until after 6 o'clock in the afternoon of the last day of the Show, and shall under no circumstances be taken out of their places in the interval without the special permission of the Stewards.

16. During the time the Show is open to the public no rug or cloth shall be hung up so as to conceal any animal in a horse-box or stall, except with the special permission of the Steward of the department. All sheets used for the purpose must be removed before 9 o'clock on each day the exhibition is open to the public, and must not be replaced until after the closing hour of the Show each day.

17. All Exhibits and all persons in charge of the same, will be subject to the Orders, Regulations and Rules of the Society, and the Stewards shall have the power to remove from the Yard the Stock or property belonging to, and to cancel the admission ticket of, any Exhibitor who shall infringe any of the Regulations or Conditions of the Meeting, or who shall refuse to comply with any instructions given by the Stewards, without any responsibility attaching to the Stewards or the Society in consequence of such removal.

18. No animal shall be decorated with colours other than the Society's Prize Rosettes.

19. No person shall be allowed to fix any placard, or to take down any official placard, in the Yard, without the written permission of the Stewards.

20. All persons in charge of Exhibits will be subject to the orders of the Stewards, and will be required to parade or exhibit the animals in their charge at such times as may be directed by the Stewards. Servants must be in attendance each day during the Show at least a quarter of an hour before the time appointed for exhibiting the animals under their charge in the Show rings. Servants in charge of animals must see that the animals' boxes or stalls are kept clean. No oil or cooking stove of any description must be lighted in the Horse Boxes and any one found offending in this respect will be dealt with in accordance with Regulation 33. Owners of animals exhibited will be held responsible for the behaviour of their Servants, and for the consequences of any misconduct of such Servants.

21. Servants in charge of Stock at night must, if they leave the yard, return before 10 p.m., or they will not be admitted.

22. On the day previous to the opening and on each day of the Show hay or green food and straw will be supplied by the Society free of expense to exhibitors at the Forage Stores in the Show Yard. Servants must apply at the Forage Stores for their Forage Tickets after they have brought their animals into the Yard. Corn, meal, and cake can be obtained in the Show Yard at fixed prices.

NOTE.—For the convenience of Exhibitors wishing to sell their animals, a Register will be kept at the Secretary's Office, in which they may enter the prices.

TICKETS.

23. Each Exhibitor of Live Stock will have a Free Ticket of admission to the Show Yard sent to him, except in the case of a Member, who will receive his Member's Badge in lieu of an Exhibitor's Ticket. Tickets for the use of Servants in charge of Live Stock remaining in the Yard will also be sent and the Exhibitor will he held responsible for the proper use of such Tickets. In the case of animals not having a box in the Yard, a Servant's Ticket will not be required as the official label will admit the Driver or Rider, Horse and Vehicle into the Yard. In case of transfer or other improper use of a Ticket the Exhibitor will be required to pay a fine of £1 for each case. Exhibitors will be held responsible for the attendance at each Parade of as many Servants as Tickets have been issued for.

RESPONSIBILITY.

24. Neither the Society nor any of its Officers or Servants shall be in any way responsible or accountable for anything that may happen (from any cause or circumstance whatever) to Exhibitors or their Servants, or to any animal or article exhibited, or property brought into the Show Yard, or otherwise for anything else in connection with, or arising out of, or attributable to, the Society's Show, or these or any other Conditions or Regulations prescribed by the Society in relation thereto.

25. Each Exhibitor shall be solely responsible for any consequential or other loss, injury, or damage done to, or occasioned by, or arising from, any animal or article exhibited by him, and shall indemnify the Society against all legal or other proceedings in regard thereto.

26. The Society, its Officers and Servants, will not be liable for any errors or mistakes that may happen in placing or penning the Stock or Articles to be exhibited, but the Servants in charge of the same must see that they are placed or penned according to their entries.

DISQUALIFICATION.

27. The use of resin, soap, sawdust above the knee, or other substances designed to give an artificial appearance; cording; or any other improper means adopted in showing an animal in the Agricultural Horse Classes will be regarded as a disqualification.

28. No animal which has been exhibited as Fat Stock at any Show shall be eligible to compete for the Prizes offered in this Prize Sheet.

29. An animal having any unsoundness likely to be transmitted to its progeny shall be disqualified thereby from receiving any Prize offered by or through the Society.

30. If it shall be proved to the satisfaction of the Stewards or Council that an Exhibitor or Competitor has knowingly signed an incorrect Certificate, or knowingly given an incorrect Pedigree of any animal, or has attempted to enter an animal or other exhibit or to obtain a Prize by any other unfair means at this or any other Agricultural Society's Meetings, or is under exclusion from any Breed Society for fraudulent practices, the Council shall have the power to cancel all awards made to such Exhibitor or Competitor, to disqualify him or her from exhibiting or competing at future Meetings of the Society, and to inform other Agricultural Associations of their action in this respect.

Penalties.

31. As the non-exhibition of animals entered for the Show causes unnecessary preparations and expense, and disarranges the Show Yard, any person entering Stock, and failing to exhibit the same, shall pay a penalty of 10s. for each entry, unless a Certificate, under the hand of the Exhibitor or his authorised agent, be lodged with the Secretary of the Society, before the day of exhibition, certifying that such non-exhibition is caused either by—(1) the death of the animal or animals; or (2) contagious or infectious disease (confirmed by the explanatory certificate of a Veterinary Surgeon); or (3) by its becoming ineligible for the Class in which it has been entered. The fine is not remitted in the case of an exhibitor selling an animal between the time of entry and the date of the Show.

32. Every Exhibitor will be required to undertake to forfeit and pay to the Society the sum of £20, as and for liquidated damages, if any animal which he exhibits be, to his knowledge, suffering from any contagious or infectious disease, and the Stewards are empowered to prevent the entry of any diseased animal into the Yard, or to have it removed therefrom.

33. Any infringement of any of these or any other prescribed Regulations or Conditions will subject the Exhibitor to a fine of £1 by the Stewards, and to the forfeiture, by order of the Council, of any prize to which he may be entitled (in addition to all other consequences attaching to such infringement). The Council reserves to itself the right to inform other Agricultural Associations of any decision it may come to with respect to an Exhibitor.

Awards.

34. The Society reserves to itself the right to withhold any prize, if, in the opinion of the Stewards, the conditions and regulations have not been properly complied with, or if, in the opinion of the Judge, there is insufficient merit.

35. Only the signed awards of the Judges are accepted by the Society as evidence that a prize has been awarded, and the production of the prize card or the rosette by an Exhibitor will not entitle him to the prize.

36. The certificate of the Veterinary Inspector, whether as to age or soundness, shall be required only in cases where the Judges are in doubt, or where the Stewards may consider it necessary. (See also Regulation 46 with reference to Stallions and Mares.) The decision of the Inspector in such cases shall be final and conclusive; and in case it shall be against the animal to which a Prize has been awarded, such animal shall be disqualified from receiving such Prize.

Protests.

37. Any Exhibitor wishing to lodge a protest having reference to Live Stock exhibited at this meeting must make the same in writing on a form to be

obtained from the Secretary, and deposit with him the sum of £3. If on investigation the protest is not sustained to the satisfaction of the Stewards, the sum thus deposited shall, at the discretion of the Council, be forfeited to the funds of the Society. All protests (except in the Harness or Jumping Classes) must be delivered at the Secretary's Office in the Show Yard, on the day on which the award is made, and no protest will be SUBSEQUENTLY received, unless a reason satisfactory to the Stewards be assigned for the delay. Any protest against an award in the Harness or Jumping Classes must be made to the Steward in the ring immediately after the judging of the class to which it refers, and a deposit of £3 must. at the same time, be handed to the Steward. The Stewards will consider such protests at 11 o'clock on the following day at the Secretary's Office, at which time and place any person making a protest must attend or be represented by his authorised agent. The decision of the Stewards shall be final.

APPLYING TO CERTAIN CLASSES ONLY.

Horses.

38. Horses can be removed from the Yard at night on deposit by the Exhibitor of £3 at the Finance Office, which sum will be forfeited if the Horse does not return at 8 A.M. each day during the Exhibition. This regulation does not apply to Animals not having a box in the Yard entered in the Harness, Saddle and Jumping Classes only.

39. Exhibitors must provide saddles for Horses in Classes 12, 13, 14, 15, 22, 24 and 32 to 41, as they are to be ridden; and vehicles and harness for those in Classes 21, 23 and 25 to 31, which are to be driven.

40. No Horse, unless a Foal, will be admitted into the ring without a proper bit.

41. The Prizes for Stallions in Classes 5 and 20 will be withheld until a certificate from the owner is delivered to the Secretary that the Horse has served at least 10 Mares during the current season.

42 All Foals must be the offspring of the Mares with which they are exhibited, and the name of the Sire of the Foal must be stated on the certificate of entry.

43 Mares entered as in-Foal shall, except as otherwise stated, hereafter be certified to have produced a living Foal before August 1st of the year of the Show. If the required certificate, which must be on a form obtainable from the Secretary, is not received by September 30, 1915, the prize awarded will be forfeited.

44. Horses may, at the discretion of the Stewards, be measured, and the measurement shall be taken in the shoes worn by the entry at the time of judging, and these shoes shall not be removed to allow of the entry being shown in another class.

45. In the Harness Classes for Hackneys exceeding 14 hands (except yearling colts and fillies) no shoe (nails included) may exceed 2 lbs. in weight, and for Ponies not exceeding 14 hands, yearling colts and yearling fillies, no shoe (nails included) may exceed 1½ lbs. in weight,

46. All Stallions and Mares (yearlings and foals excepted) to which prizes have been awarded in the breeding classes shall be examined by the Society's Veterinary Inspector, and unless pronounced free from indications of hereditary disease shall be ineligible to receive the prize. The owner of an Animal rejected under this Regulation may, upon his application in writing to the Secretary, be furnished with a copy of the Veterinary Certificate. This Regulation shall not, however, apply to animals holding a Board of Agriculture Certificate for the current year.

47. The following special conditions apply only to the Prizes offered by the Shire Horse Society, viz.: the owner of the animal entered to have been a Member of the Bath and West and Southern Counties Society, or

of the Herefordshire and Worcestershire Agricultural Society for not less than six months previous to April 3, 1915; a Mare five years old, or upwards, must produce a living Foal in the current year, or have had a living Foal in the preceding year; in the case of in-Foal Mares a certificate of foaling must be lodged with the Secretary of the Shire Horse Society before the medal will be despatched. No animal to compete which has won the Shire Horse Society's Gold Medal during the current year; the Royal and London Shows being excepted; the winning animal to be entered, or eligible for entry, in the Shire Horse Society's Stud Book; and a certificate that the winner is free from hereditary disease signed by the Society's Veterinary Inspector after his examination on the Show Ground, must be lodged with the Secretary of the Shire Horse Society, but Stallions on the Register of the Board of Agriculture, and Stallions, Mares and Fillies passed at the London Show, shall be exempt from further examination when selected for Medals during the current year. A prize of £5 will also be awarded to the breeder of the animal winning the Medal, provided that he is a member of the Shire Horse Society, and that the Dam is a Mare registered in the Shire Horse Stud Book. All awards must be completed within six months of the date upon which the Medal was awarded, or they will be void.

48. The following special conditions apply only to the Prize offered by the Hunters' Improvement and National Light Horse Breeding Society for Hunter Brood Mares, viz.:—The Mare awarded the Medal must possess a certificate of soundness from hereditary disease, signed by the Bath and West Society's appointed Veterinary Inspector, who must be a member of the Royal College of Veterinary Surgeons, after his examination of the animal on the Show Ground. Any Hunter Brood Mare, 8 years old or over, having been either awarded one of the Society's Gold Medals in 1913, to 1915, or selected as Reserve for same, or having been passed sound after January 1, 1911, by a Veterinary Surgeon appointed by the Hunters' Improvement and National Light Horse Breeding Society, shall be exempt from further examination upon the owner producing at the time of exhibition the official veterinary certificate issued by the Secretary of that Society.

49. The following special conditions apply only to the Prize offered by the Hunters' Improvement and National Light Horse Breeding Society for best Mare or Gelding of any age. The Hunter awarded the medal must possess a certificate of soundness from hereditary disease, signed by the Bath and West Society's Veterinary Inspector, who must be a member of the Royal College of Veterinary Surgeons, after his examination of the animal on the Show Ground. The selected Mare, if unregistered, or the selected Gelding, if unentered, must be registered or entered within a month of the award in the Hunter Stud Book. No animal may take more than one of these medals in 1915.

NOTE.—No awards of the above-named Society's Prizes or Medals to a Hunter named and registered in the Hunter Stud Book and subsequently entered by the owner under another name, will be recognised or confirmed unless a re-entry has been previously lodged by the owner for the Hunter Stud Book and the new name registered by the Society.

50. The following special conditions apply only to the Silver Medal offered by the Hackney Horse Society in the Single Harness Classes:—All horses competing for the Medal must be *by a Registered Hackney Sire.* A certificate signed by the Breeder of the animal must be forwarded to the Secretary of the Hackney Horse Society before the Medal is despatched. Each animal must be examined by a qualified veterinary surgeon on the Show Ground, and a certificate of soundness must be supplied. The Medal must be open to all Classes, and not confined to local competition, and the name and number of the sire, and the name and address of the breeder of each animal, should appear in the catalogue. No animal can take more than one Medal in any one year.

51. The following special conditions apply only to the Medals offered by the National Pony Society. Height of Stallions and Colts not to exceed 15 hands, and Mares and Fillies not to exceed 14.2, as confirmed by Hurlingham Certificate or

that of a qualified Veterinary Surgeon. Ponies having previously won the National Pony Society's Gold Medal during the current year not to be eligible to compete, and no Pony is qualified to take more than one Silver Medal under the same scheme during any one year. The entry of the Winner must, if not already entered in the Supplement or Registered in the Stud Book, be duly lodged with the National Pony Society before the Medals will be despatched. All Brood Mares to have foal-at-foot or be due to foal in 1915. or if they have foaled in 1915 and the foal has died, a veterinary certificate to the effect that the foal was born alive to be provided. All foals to be by a Thoroughbred, Eastern, Registered or Entered Sire.

52. The following special conditions apply to Horses entered in the Jumping Competitions :—The jumps may consist of single hurdle, gate, double hurdle, bank, wall and water jump, at the discretion of the Judge and Stewards. Each horse competing shall have its catalogue number affixed to its breast in such a way that it may be easily seen by the general public. Each horse competing shall be ridden at the fences in the order announced by the Stewards. In case of a horse refusing his fence it shall be allowed two further trials, and *no more*. No change of rider shall take place during the competition. The Judge may take into consideration the style in which the fences are jumped, as well as the height and breadth, and his decision shall be final.

CATTLE.

53. All cattle must be properly secured to the satisfaction of the Officers of the Society, on being brought to the gate of the Yard, or they will not be admitted.

54. All Bulls must have a ring or clamp attached to the nose, and in the aged Classes must be provided with a strong chain, and be led with a proper stick.

55. All cattle will be required to be paraded in the ring at least once a day at the discretion of the Stewards.

56. No Bull calved before January 1st, 1913, or in the Aberdeen-Angus Classes before December 1st, 1912, will be eligible to receive a Prize until certified to have served not less than six different Cows (or Heifers) previous to June 1st, 1915, and to be the sire of live calves dropped in the year 1915, or in the Aberdeen-Angus Classes after December 1st, 1914.

57. No Cow or Heifer, entered as in-milk, will be eligible to receive a Prize unless certified to have had a living Calf within the fifteen months preceding the date of Show, or that the Calf, if dead, was born at the proper time.

58. Every Cow or Heifer in-milk shall be milked dry in the Show Yard at 7.30 p.m. on the evening preceding the day of judging, in the presence of an officer of the Society appointed for the purpose.

59. Any animal in the Cattle Classes found to be artificially coloured will be disqualified.

60. Any person selling milk in the Yard, except in the place appointed by the Stewards, will be fined 5s. for each infringement of this Regulation. All Milk will be purchased by the Society's Milk Contractor, and notice as to the time of collection will be posted in the Show Yard. The Milk from Cows exhibited must not be taken out of the Yard for Sale without the permission of the Stewards.

61. The following conditions apply only to the prizes offered for Pedigree Shorthorn Dairy Cows :—The Cows and Heifers entered will be clean milked out at 6 o'clock on the evening preceding the opening of the Show to the satisfaction of the Stewards, and will be again milked in the ring on the first

morning of the Show in the presence of the Judge, who shall see the Milk weighed, and any animal not yielding up to the following standard will not be awarded a prize :—

	If she has calved within three calendar months of the first day of the Show.	If she has calved more than three calendar months before the first day of the Show.
Cows, 4 years old and upwards, *not less than* ..	25 lbs. of Milk	20 lbs. of Milk
Cows, 3 years old and under 4 „ „ ..	20 „ „ „	15 „ „ „
Heifers, under 3 years old „ „ ..	15 „ „ „	10 „ „ „

62.—In the Kerry and Dexter Classes clipping (except in the case of a few hairs on the top of the tail) will disqualify an animal.

63. The following condition applies to animals entered in the Milk Test Classes :—The date of last calving must be given on the entry form and, when an animal calves between the date of entry and that of the Show, notice of such calving must be sent to the Secretary, or the animal may be disqualified. Points for Lactation will be allowed as follows:—(*a*) Cows whether served or not within 90 days after calving may obtain maximum points for lactation. (*b*) Cows which have calved 91 to 120 days and whose last service has been within that time, but not later, can only obtain a maximum of 8 points for lactation. (*c*) Cows which have calved 121 to 150 days and whose last service has been within that time, but not later, can only obtain a maximum of 4 points for lactation. (*d*) Cows which have calved 151 days or more, and have not been served within that time, will not receive any points for lactation.

A certificate giving the last date of calving and the last date of service, and stating that the Cow has not broken her service since that date, signed by the Owner of the Cow exhibited or his Agent, to be delivered by the Herdsman to the Steward or Judge of the Test on or before the first day of the Show.

64. Except in the Local and Dairy Classes, every animal entered for competition must be entered, or certified as eligible to be entered, in the Herd Book of its Breed, where such Herd Book exists and has been in existence for not less than seven years. Where an animal is entered by the Exhibitor as eligible for entry in the Herd Book of its breed, proof of such eligibility must be furnished to the Secretary at the time of making the entry.

SHEEP.

65. Each pen of Ewes must be of the same Flock.

66. The following conditions apply to the special prize offered by the Southdown Sheep Society :—The sheep competing must be entered or eligible for entry in the Flock Book. In the Class for pairs of ram lambs, exhibitors will have the privilege of competing for the medal with any one of their exhibits.

67. Except in the Local Classes, every animal entered for competition must be entered or certified as eligible to be entered, in the Flock Book of its Breed, where such Flock Book exists and has been in existence for not less than seven years. Where an animal is entered by the Exhibitor as eligible for entry in the Flock Book of its breed, proof of such eligibility must be furnished to the Secretary at the time of making the entry.

PIGS.

68. The pair of Pigs in each pen must be of the same litter.

69. All Sows farrowed before 1915 shall be certified to have had a litter of live Pigs within six months preceding the first day of exhibition, or to be in-pig at the

time of entering, so as to produce a litter of Pigs, farrowed at their proper time, before the 1st of September following. In the case of in-Pig Sows the Prize will be withheld until the Exhibitor shall have furnished the Secretary with a certificate of farrowing as above. If the required Certificate, which must be on a form obtainable from the Secretary, is not received on or before the 15th September following, the Prize awarded will be forfeited.

70. All Pigs exhibited with a Sow shall be her own produce, of the same litter, and not exceeding two months old at the time of the Show.

71. No Sow above 18 months old that has not produced a litter of live Pigs shall be eligible to compete in any of the Classes.

72. Any animal in the Pig Classes found to be artificially coloured or oiled will be disqualified.

73. Should any question arise as to the age of any exhibit in the Pig classes, the Stewards shall, at the request of the Judge, have the state of their Dentition examined by a competent authority. If the state of the Dentition shall indicate that the age of any of the Pigs does not agree with the Dentition Test, the Stewards shall report the same to the Council, who shall have power to disqualify such Pig or Pigs. The following is the state of Dentition in Pigs which will be considered as indicating that they exceed the ages specified below :—Six Months : Pigs having their corner permanent incisors cut will be considered as exceeding this age. Nine months : Pigs having their permanent tusks more than half up, will be considered as exceeding this age. Twelve Months : Pigs having their central permanent incisors up, and any of the three first permanent molars cut, will be considered as exceeding this age. Fifteen Months : Pigs having their lateral temporary incisors shed, and the permanents appearing, will be considered as exceeding this age. Eighteen Months : Pigs having their lateral permanent incisors fully up will be considered as exceeding this age.

Cider, Dairy Produce, Butter-Making and Milking Competitions.

For Conditions and Regulations see entry forms.

Adjudication of Prizes.

74. The Judges are instructed as follows, and entries are received subject to this :

a. Not to award any Prize or Commendation unless the entry possesses sufficient merit.

b. Not to award a Prize to any Horse or Mare, unless it is free from unsoundness likely to be transmitted to its progeny ; or if a Gelding, unless free from unsoundness ; in either case, an accident having temporary consequences only excepted, and in awarding the Hunters' Improvement Society's Medals to give preference to animals showing weight-carrying properties.

c. In awarding Prizes to Cattle, Sheep and Pigs, to decide according to the relative merits of the animals for Breeding purposes. and not to take into consideration their present value to the butcher.

d. To make the milking capacity and form of udder one of the chief points in awarding prizes to Cows and Heifers in Milk.

e. To draw the attention of the Stewards to any exhibit that has been improperly prepared for exhibition, or is wrongly entered.

f. To give in a "Reserve Number" in each Class, indicating the animal or exhibit which in their opinion possesses sufficient merit for the Prize, if the animal or exhibit to which the Prize is awarded should become disqualified. Should the "Reserved Number" succeed to a prize, and be itself disqualified, the prize will be forfeited.

g. Immediately after the Judging to deliver to the Stewards their signed awards stating the numbers to which the Prizes are adjudged, and noting all disqualifications.

75. Should any question arise upon which the Judges may desire a further opinion, the Stewards shall provide them with a Referee.

Payment of Prizes.

76. Cheques for the Prizes awarded (except where further qualification of an animal is required) will be drawn at the meeting of the Finance Committee held in July, 1915, and will then be forwarded by post to the Exhibitors to whom they have been awarded.

Interpretation of Conditions.

77. The Society reserves to itself by its Council the sole and absolute right to interpret these or any other prescribed conditions and regulations, or Prize Sheets, and to arbitrarily settle and determine all matters, questions or differences in regard thereto, or otherwise arising out of or connected with or incident to the Show. Also to refuse and to cancel any entries, disqualify Exhibitors, prohibit exhibition of entries, vary or cancel awards of prizes or reserved numbers, and relax conditions, as the Society may deem expedient.

FINANCIAL STATEMENTS

FOR

1914

WITH ITEMS OF 1913 *FOR COMPARISON.*

The Bath and West and

SUMMARY OF THE CASH ACCOUNT

DR. WITH COMPARATIVE

Page of accompanying Cash Account.	RECEIPTS.				1914. Swansea. £ s. d.		1913. Truro. £ s. d.
	General:—						
cxxxii	Dividends and Interest				655 18 1		653 6 0
cxxxii	Miscellaneous				0 8 7		3 5 7
cxxxii	Subscriptions from Members				984 2 0		990 0 0
cxxxii	Life Members				20 0 0		15 0 0
cxxxii	Journal				42 1 5		44 10 7
						1,702 10 1	1,706 2 2
	Show:—						
cxxxii	Implements				1,737 17 0		1,269 15 [illegible]
		£	s.	d.			
cxxxiv	Horses	789	7	9			875 17 6
cxxxiv	Cattle, Sheep and Pigs	768	0	0			912 10 0
cxxxiv	Catalogues, &c.	101	8	2			108 7 9
					1,658 15 11		1,896 15 3
cxxxiv	Poultry				74 3 7		75 1 [illegible]
cxxxvi	Shoeing				57 10 0		21 10 [illegible]
cxxxvi	Timbering and Splicing				22 2 6		
cxxxvi	Art Manufactures						29 8 0
cxxxviii	Horticulture				146 10 6		
cxxxviii	Cheese and Butter				65 15 8		78 2 [illegible]
cxxxviii	Working Dairy				147 9 6		184 6 3
cxxxviii	Cider				12 15 0		11 7 [illegible]
cxl	Admissions				5,462 18 3		3,857 10 6
cxl	Unapportionable:—						
	Contract Premiums	549	10	0			496 12 0
	Sales and Fittings	441	19	8			415 13 3
					991 9 8		912 5 3
cxl	Subscription from Swansea for 1914 Show						800 0 [illegible]
						10,377 7 7	9,136 2 5
						12,079 17 8	10,842 4 7
cxlii	Balance in Bank, January 1st					293 15 5	406 9 [illegible]
cxlii	Balance due to Bank, December 31st					58 15 5	
					£	12,432 8 6	11,248 14 [illegible]

Southern Counties Society.

FOR THE YEAR ENDING DEC. 31st, 1914.

STATEMENT FOR 1913. Cr.

Page of accompanying Cash Account.	PAYMENTS.		1914. Swansea.		1913. Truro.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
	General:—				
cxxxiii	Salaries		1,100 0 0		1,100 0 0
cxxxiii	Printing, Postage, Stationery, &c.		242 15 1		226 6 7
cxxxiii	Journal		424 17 1		406 18 7
				1,767 12 2	1,733 5 2
	Show:—				
cxxxiii	Implements		592 5 2		475 5 7
cxxxv	Horses	1,127 2 6			1,256 17 9
cxxxv	Cattle, Sheep, and Pigs	2,400 18 8			2,413 11 11
cxxxv	Fodder, &c.	428 2 9			580 2 6
			3,956 3 11		4,250 12 2
cxxxv	Poultry		258 4 1		246 9 1
cxxxvii	Shoeing		175 1 3		141 15 8
cxxxvii	Timbering and Splicing		35 11 6		
cxxxvii	Art Manufactures				78 8 9
cxxxvii	Nature Study		56 4 10		75 18 3
cxxxvii	Forestry		92 2 3		95 18 10
cxxxvii	Music		181 18 7		258 5 1
cxxxix	Horticulture		360 2 6		164 0 5
cxxxix	Bees		10 0 0		
cxxxix	Cheese and Butter		208 10 6		286 16 3
cxxxix	Working Dairy		540 1 10		554 3 2
cxxxix	Cider		116 2 4		100 8 1
cxli	Public Announcements		430 16 10		382 3 3
cxli	Unapportionable:—				
	Erection of Offices, &c.	1,242 4 8			1,376 17 0
	Carriage of Plant	90 11 3			111 15 9
	Stand Fittings	157 9 4			174 9 3
	Police	121 7 6			105 12 6
	Miscellaneous	439 18 0			292 14 4
			2,051 10 9		2,061 8 10
				9,064 16 4	9,121 13 5
cxliii	**Experiments:—**			100 0 0	100 0 0
				10,932 8 6	10,954 18 7
cxliii	**Investments and Deposit**			1,500 0 0	
cxliii	Balance in Bank, Dec. 31st.				293 15 5
				£ 12,432 8 6	11,248 14 0

January 18th, 1915.
Audited and found correct,
F. CLIFFORD GOODMAN, F.C.A.,
Auditor.

Passed by Council,
January 26th, 1915.
THOS. F. PLOWMAN,
Secretary.

The Bath and West and

DR. CASH ACCOUNT FOR THE YEAR ENDING DEC. 31ST,

RECEIPTS.	1914. Swansea. £ s. d.	1914. Swansea. £ s. d.	1913. Truro. £ s. d.
DIVIDENDS AND INTEREST :—			
Consols	137 1 3		137 10 4
New Zealand Stock	51 8 11		51 13 6
India Stock	212 5 2		212 19 4
Queensland Stock	103 3 6		103 12 8
New South Wales Stock	65 14 4		66 0 2
Canadian Pacific Stock	56 5 0		56 10 0
Interest on Deposit	29 19 11		25 0 0
		655 18 1	653 6 0
GENERAL RECEIPTS :—			
Waste Paper, &c.		0 8 7	3 5 7
SUBSCRIPTIONS FROM MEMBERS :—			
Arrears	27 13 0		18 5 0
Governors	167 15 0		171 17 0
Subscribers of £1 and upwards	781 14 0		792 8 0
Ditto of 10s.	7 0 0		7 10 0
		984 2 0	990 0 0
LIFE COMPOSITIONS		20 0 0	15 0 0
JOURNAL :—			
Sales	6 17 10		8 5 10
Advertisements	35 3 7		36 4 9
		42 1 5	44 10 7
IMPLEMENTS :—			
Fees for Space :—			
Machinery-in-Motion Shedding	482 5 0		297 5 0
Ordinary ”	269 5 0		175 10 0
Miscellaneous ”	186 15 0		80 12 6
Boarded ”	378 15 0		313 17 6
Seed ”	31 10 0		22 10 0
Uncovered Ground	284 12 0		265 8 8
Catalogue Fees	86 15 0		59 12 0
Entry Fees	68 0 0		55 0 0
		1,787 17 0	1,269 15 8
Carried forward		£3,440 7 1	

Southern Counties Society.

1914, WITH COMPARATIVE STATEMENT FOR 1913. Cr.

PAYMENTS.	1914. Swansea. £ s. d.	£ s. d.	1913. Truro. £ s. d.
SALARIES:—			
Secretary (including Clerks, Show Expenses, &c.)	1,050 0 0		1,050 0 0
Auditor	20 0 0		20 0 0
Consulting Chemist	30 0 0		30 0 0
		1,100 0 0	1,100 0 0
MISCELLANEOUS:—			
Printing	9 8 6		14 1 10
Stationery and Finance Books	40 4 0		38 15 5
Postages, Telegrams, Cheque and Receipt Stamps	60 16 10		62 7 9
Ground Rent and Rates	21 17 1		20 19 4
Income and Property Tax	2 3 9		2 3 9
Travelling Expenses	32 2 0		36 1 3
Carriage of Goods	13 13 5		8 16 1
Directories and Reference Books	2 7 4		1 5 7
Subscriptions and Grant	11 11 0		6 6 0
Repairs and Fittings	5 6 1		15 15 5
Hire of London Rooms for Meetings	3 3 0		3 3 0
Fuel and Light	3 16 1		7 17 6
Telephone	6 6 0		8 13 8
Lawes Agricultural Trust	21 0 0		
		242 15 1	226 6 7
JOURNAL:—			
Editor	100 0 0		100 0 0
Associate Editor	100 0 0		100 0 0
Printing and Binding	152 6 0		146 5 9
Plans and Blocks	15 17 6		10 15 0
Journal Distribution	18 12 1		18 10 10
Postages, Stationery, Reference Books, &c.	4 0 6		4 9 0
Payments to Authors	34 1 0		26 18 0
		424 17 1	406 18 7
IMPLEMENTS:—			
Shedding	501 10 6		394 0 5
Stewards and Assistants	54 19 7		60 8 5
Printing, Stationery, &c.	24 0 7		20 16 9
Fees returned	11 14 6		
		592 5 2	475 5 7
Carried forward	£	2,359 17 4	

Dr. CASH ACCOUNT—*continued.*

RECEIPTS.	£ s. d.	1914. Swansea. £ s. d.	£ s. d.	1913. Truro. £ s. d.
Brought forward .			3,440 7 1	
HORSES, CATTLE, SHEEP AND PIGS :—				
Horses :—Entry Fees . .	232 15 0			199 15 0
Fines . .	2 10 0			2 0 0
Grand Stand Admissions	356 9 3			553 12 6
Special Prizes .	197 13 6			120 10 0
		789 7 9		875 17 6
Cattle, Sheep and Pigs :—				
Entry Fees . .	459 10 0			537 10 0
Fines . . .	26 10 0			17 0 0
Special Prizes .	282 0 0			358 0 0
		768 0 0		912 10 (
Catalogues, Manure and Fodder . .		101 8 2		108 7 [illegible]
			1,658 15 11	1,896 15 [illegible]
POULTRY :—				
Entry Fees		72 12 0		73 19 (
Commission on Sales		1 11 7		1 2 [illegible]
			74 3 7	75 1 [illegible]
Carried forward . .			£ 5,173 6 7	

CASH ACCOUNT—*continued.* Cr.

PAYMENTS.	£ s. d.	1914. Swansea. £ s. d.	1914. Swansea. £ s. d.	1913. Truro. £ s. d.
Brought forward .			2,359 17 4	
HORSES, CATTLE, SHEEP AND PIGS :—				
Horses—Prizes . 817 13 6				
Less deferred 17 0 0				
	800 13 6			795 3 0
Shedding & Grand Stand	214 14 8			358 16 1
Stewards and Assistants	60 6 2			61 0 2
Judges . . .	50 3 2			41 18 6
Fees returned . .	1 5 0			
		1,127 2 6		1,256 17 9
Cattle—Prizes £1,085 4 7				1,015 12 0
Less deferred 5 0 0				2 0 0
	1,080 4 7			1,013 12 0
Sheep—Prizes . . .	492 1 0			552 5 0
Pigs—Prizes . . .	183 3 0			204 2 10
Shedding and Canvas	419 19 5			426 13 4
Stewards and Assistants	44 7 1			36 3 9
Judges . . .	177 3 7			179 15 0
Fees Returned .	4 0 0			1 0 0
		2,400 18 8		2,413 11 11
Buildings, etc. . . .	98 14 10			258 2 9
Fodder and Insurance .	203 9 0			225 18 9
Fodder Assistants . .	8 9 4			8 18 3
Veterinary Inspector .	32 5 6			27 17 2
Rosettes	13 10 2			12 14 4
Printing and Stationery .	49 4 0			39 16 11
Refreshments to Judges .	14 3 3			6 14 4
Cheques Stamps . .	8 6 8			
		428 2 9		580 2 6
			3,956 3 11	4,250 12 2
POULTRY :—				
Sheds, Staging and Pens		70 10 8		46 9 7
Steward and Assistants		23 14 4		25 15 7
Judges		18 11 0		16 13 6
Prizes		142 10 0		146 0 0
Printing, Stationery, Cartage, &c. . .		7 18 1		11 10 5
			258 4 1	246 9 1
Carried forward .		£	6,574 5 4	

DR. CASH ACCOUNT—*continued.*

RECEIPTS.	1914. Swansea. £ s. d.	£ s. d.	1913. Truro. £ s. d.
Brought forward		5,173 6 7	
SHOEING:—			
Entry Fees		57 10 0	21 10 0
TIMBERING AND SPLICING:—			
Entry Fees	3 2 6		
Special Prizes	14 0 0		
Sale of Wood, etc.	5 0 0		
		22 2 6	
ART-MANUFACTURES			29 8 0
Carried forward	£	5,252 19 1	

CASH ACCOUNT—*continued.* CR.

PAYMENTS.	1914. Swansea. £ s. d.	1914. Swansea. £ s. d.	1913. Truro. £ s. d.
Brought forward		6,574 5 4	
SHOEING :—			
Prizes	44 10 0		34 10 0
Judges	11 0 6		12 16 6
Anvils, Forges, Coal, Horses, Printing, etc.	19 7 7		12 5 7
Shedding	40 14 9		38 7 9
Stewards and Assistants	19 8 5		18 4 0
Fees returned	25 0 0		10 11 10
Exhibition of Models	15 0 0		15 0 0
		175 1 3	141 15 8
TIMBERING AND SPLICING :—			
Prizes	14 0 0		
Judges and Assistants	7 0 9		
Shedding, Rope, &c.	13 12 3		
Printing, Postage, &c.	0 9 6		
		35 11 6	
ART-MANUFACTURES :—			78 8 9
NATURE STUDY :—			
Labour and Fittings	42 0 8		68 13 3
Steward and Assistants	11 17 9		6 1 0
Printing, Postage, etc.	2 6 5		1 4 0
		56 4 10	75 18 3
FORESTRY :—			
Labour and Fittings	68 6 3		66 19 10
Steward and Assistants	6 0 0		9 0 0
Printing, Postage, etc.	1 11 6		2 8 6
Prizes	6 17 6		7 0 0
Judge and Demonstrator	9 7 0		10 10 6
		92 2 3	95 18 10
MUSIC :—			
Bands and their Fares	170 0 0		226 0 0
Steward and Assistants	6 4 7		4 16 0
Erecting Band Stand and Seats	5 14 0		27 9 1
		181 18 7	258 5 1
Carried forward		£ 7,115 3 9	

Dr. CASH ACCOUNT—*continued.*

RECEIPTS.		1914. Swansea. £ s. d.	1914. Swansea. £ s. d.	1913. Truro. £ s. d.
Brought forward			5,252 19 1	
HORTICULTURE :—				
Admissions at 1s.		53 1 0		
Admissions at 6d.		93 9 6		
			146 10 6	
CHEESE AND BUTTER :—				
Entry Fees		40 15 0		53 5 0
Sales		14 5 8		13 7 5
Special Prizes and Fines		10 15 0		11 10 0
			65 15 8	78 2 5
WORKING DAIRY :—				
Admissions		11 3 0		12 12 3
	£ s. d.			
Entry Fees, Competitions	43 17 6			81 15 0
" Appliances	9 9 0			6 6 0
" Tests	23 0 0			13 0 0
		76 6 6		101 1 0
Sale Premium		35 0 0		5 1 0
Special Prizes		25 0 0		65 12 0
			147 9 6	184 6 3
CIDER :—				
Entry Fees			12 15 0	11 7 6
Carried forward			£ 5,625 9 9	

CASH ACCOUNT—*continued.*   Cr.

PAYMENTS.	1914. Swansea. £ s. d.	1914. Swansea. £ s. d.	1913. Truro. £ s. d.
Brought forward		7,115 3 9	
HORTICULTURE:—			
Gratuities to Gardeners	167 0 0		108 0 0
Erecting and Repairing Tent and Staging	160 18 7		41 6 0
Steward and Assistants, Printing, &c.	32 3 11		14 14 5
		360 2 6	164 0 5
BEES:—			
Beekeepers' Association		10 0 0	
CHEESE AND BUTTER:—			
Judges	12 10 6		14 18 9
Prizes	143 10 0		145 10 0
Stewards and Assistants	9 18 6		13 9 5
Shedding	35 3 9		53 1 1
Printing, Stationery, Carriage, &c.	2 7 9		2 13 9
Grass Table for Butter Exhibits	5 0 0		7 3 3
		208 10 6	236 16 3
WORKING DAIRY:—			
Stewards and Assistants	52 7 6		71 4 6
Judges and Demonstrators	98 0 2		90 1 5
Buildings	258 7 5		221 11 8
Printing, Stationery, Postages and Insurance	6 14 8		9 13 1
Utensils, Carriage, Cows for Milking, &c.	40 1 7		63 13 9
Prizes	66 0 6		76 7 6
Coal, Salt, Ice, &c.	5 8 11		8 7 9
Consulting Chemist for Analyses	13 1 1		13 3 6
		540 1 10	554 3 2
CIDER:—			
Shedding and Fittings	35 14 0		29 14 10
Steward and Assistants	22 8 11		22 6 2
Judge	5 18 11		5 13 7
Prizes	30 10 0		26 11 0
Analyses, Carriage, Printing, &c.	21 10 6		16 2 6
		116 2 4	100 8 1
Carried forward		£ 8,350 0 11	

Dr. CASH ACCOUNT—*continued.*

RECEIPTS.	1914. Swansea. £ s. d.	1914. Swansea. £ s. d.	1913. Truro. £ s. d.
Brought forward .		5,625 9 9	
Admissions to Show-Yard:—			
Admissions at 2*s.* 6*d.*	2,017 15 0		1,326 2 6
" " 1*s.*	3,142 17 0		2,042 11 0
" " 6*d.* and 3*d.*	158 10 0		108 17 0
Season Tickets, etc.	143 16 3		380 0 0
		5,462 18 3	3,857 10 6
Show (Unapportionable):—			
Sales, Fittings, etc.	441 19 8		415 13 3
Contract Premiums	549 10 0		496 12 0
		991 9 8	912 5 3
Subscriptions from Towns:—			
Swansea, for 1914 Show			800 0 0
Carried forward .		£12,079 17 8	

CASH ACCOUNT—*continued.* CR.

PAYMENTS.	1914. Swansea. £ s. d.	1914. Swansea. £ s. d.	1913. Truro. £ s. d.
Brought forward .		8,350 0 11	
PUBLIC ANNOUNCEMENTS:—			
Advertising	170 12 8		176 16 2
Billposting.	144 0 0		124 0 0
Railway Placards	69 15 0		47 0 6
Printing	46 9 2		34 7 1
		430 16 10	382 8 3
SHOW (UNAPPORTIONABLE):—			
Official Buildings, &c.	1,117 14 10		1,106 8 2
Hoarding	124 9 10		270 18 10
Carriage of Plant	90 11 8		111 15 9
Works Assistant.	6 3 4		6 19 10
Stand Fittings	157 9 4		174 9 3
Insurance	20 0 8		14 16 6
Furnishing Official Buildings . . .	31 2 8		19 2 8
Mess Room, Allotment Expenses, &c. . .	15 13 8		10 4 6
Gatekeepers, Yardmen, Messengers, &c. .	105 13 10		95 17 10
Stewards of Finance and Treasurer . .	32 2 6		20 9 5
Finance Office and Treasurer's Clerks . .	48 2 2		39 13 7
Police	121 7 6		93 12 6
Ditto (1912 Account)			12 0 0
Badges, &c.	4 10 5		4 3 1
Catalogues for Press and Officials . .	3 1 0		7 1 0
Purchase of Plant	60 4 2		14 5 6
Printing, Stationery, Commission on Sale of Tickets, &c.	39 1 2		48 18 11
Extension of Telegraph Wires . . .	13 5 0		11 6 6
Telephone Office	10 17 5		
Swansea Hospital	50 0 0		
		2,051 10 9	2,061 8 10
Carried forward .		£ 10,832 8 6	

Dr. CASH ACCOUNT—*continued.*

RECEIPTS.	1914. Swansea.						1913. Truro.		
	£	s.	d.	£	s.	d.	£	s.	d.
Brought forward .				12,079	17	8			
				12,079	17	8	10,842	4	7
Balance in Bank, Jan. 1st . .				293	15	5	406	9	5
Balance due to Bank, Dec. 31st . .				58	15	5			
			£	12,432	8	6	11,248	14	0

CASH ACCOUNT—*continued.* Cr.

PAYMENTS.	1914. Swansea. £ s. d.	£ s. d.	1913. Truro. £ s. d.
Brought forward		10,832 8 6	
EXPERIMENTS:—			
Cider Institute		100 0 0	100 0 0
		10,932 8 6	10,954 18 7
INVESTMENTS AND DEPOSIT		1,500 0 0	
Balance in Bank, Dec. 31st			293 15 5
		£ 12,432 8 6	11,248 14 0

Jan. 18*th*, 1915.

I hereby certify that I have examined the foregoing accounts for the year ending December 31st, 1914, compared the payments entered with the vouchers, and found them all in order and correct.

F. CLIFFORD GOODMAN, F.C.A.,
Auditor.

Passed by Council,
Jan. 26*th*, 1915,
THOS. F. PLOWMAN,
Secretary.

ASSETS AND LIABILITIES ACCOUNT TO DECEMBER 31ST, 1914, WITH COMPARISON FOR 1913.

ASSETS.

		1914 Swansea. £ s. d.	1913. Truro. £ s. d.
INVESTMENTS		17,559 10 2	16,828 3 1

	Par. Value. £ s. d.	Actual Cost £ s. d.	Market Value on Dec. 31. £ s. d.
New Zealand Stock	1,568 1 6	1,500 0 0	1,364 4 6
Consols	5,841 17 11	5,809 19 6	4,001 14 0
India "	7,538 15 1	7,277 5 1	5,352 10 4
Queensland "	2,751 9 0	3,000 0 0	2,723 18 8
N. S. Wales "	1,752 8 10	2,000 0 0	1,734 18 4
Canadian Pacific Rly.	1,500 0 0	1,576 2 6	1,387 10 0
South Australian "	1,036 3 3	1,000 0 0	994 14 4
	21,988 15 7	22,163 7 1	17,559 10 2

		1914 Swansea. £ s. d.	1913. Truro. £ s. d.
CASH ON DEPOSIT		1,500 0 0	1,000 0 0
CONTRIBUTION DUE FROM WORCESTER		400 0 0	
PLANT:—			
Works	219 5 9		183 8 10
Dairy	18 17 4		20 19 3
		238 3 1	204 8 1
HOUSE PROPERTY	633 10 7		633 10 7
FURNITURE AND FITTINGS	166 6 8		170 11 11
		799 17 3	804 2 6
SUBSCRIPTION ARREARS		82 14 0	69 18 0
		20,580 4 6	18,906 11 8
BALANCE IN BANK			293 15 5
		£ 20,580 4 6	19,200 7 1

LIABILITIES.

	1914. Swansea. £ s. d.	1913. Truro. £ s. d.
DEFERRED PRIZES	22 0 0	2 0 0
WORCESTER MEETING	400 0 0	800 0 0
JOURNAL, cost of, estimated at	450 0 0	450 0 0
DUE TO BANK	58 15 5	
	930 15 5	1,252 0 0
BALANCE	19,649 9 1	17,948 7 1
	£ 20,580 4 6	19,200 7 1

January 18th, 1915.

I hereby certify that I have audited the above Balance Sheet, and that, in my opinion, it is correct, and shows the true position of the Society's affairs according to the Books. The securities for the Society's Investments have been produced to me, and I have found them in order.

F. CLIFFORD GOODMAN, F.C.A., Auditor.

Passed by Council
January 26th, 1915.
THOS. F. PLOWMAN, Secretary.

Bath and West and Southern Counties Society.

STATEMENT SHOWING FINANCIAL RESULT OF THE SWANSEA (1914) SHOW.

Printed Financial State-ments. Page		£	s.	d.	£	s.	d.	£	s.	d.
cxxx	Show Receipts as per Summary . .				10,377	7	7			
	Contribution from Swansea, included in 1913 Accounts				800	0	0			
								11,177	7	7
cxxxi	Show Payments as per Summary . . .				9,064	16	4			
cxliv	Deferred Prizes				22	0	0			
					9,086	16	4			
cxli	Less Show Plant purchased . .	60	4	2						
	Less 10 per cent. for depreciation .	6	0	5						
					54	3	9			
								9,032	12	7
	Net profit . . .							2,144	15	0

Bath and West and Southern Counties Society,

FOR THE

Encouragement of Agriculture, Arts, Manufactures and Commerce.

List of Members, 1915.

PATRON.

HIS MOST GRACIOUS MAJESTY THE KING.

PRESIDENT

FOR 1914-1915.

THE RIGHT HON. THE EARL OF COVENTRY.

TRUSTEES.

THE MOST HON. THE MARQUIS OF BATH.
SIR C. T. D. ACLAND, BART.
C. L. F. EDWARDS, ESQ.

Names thus (*) distinguished are Governors.
Names thus (†) distinguished are Life Members.
⁂ *Members are particularly requested to make the Secretary acquainted with any errors in the names of residences.*

Name.	Residence.	£	s.	d.
†*His Most Gracious Majesty the King . . .	Windsor Castle	..		
†Ackers, B. St. John . .	Huntly Manor, Huntly, Gloucester	..		
Ackers, Chas. P. . .	Huntley Manor, Gloucester . .	1	0	0
Ackland, J. . . .	Cutton Farm, Poltimore, Exeter .	1	0	0
Acland, Alfred Dyke . .	. . . .	1	0	0
†Acland, Rt. Hon. A. H. Dyke	29, St. James' Court, Buckingham Gate, London, S.W. . .	..		
*Acland, Sir C. T. D., Bart.	Killerton, Exeter	5	0	0
Acland, F. Dyke, M.P. .	5, Cheyne Place, London, S.W. .	1	0	0
Adams, E. C. . . .	Brentwood, Combe Down, Bath .	1	0	0
Adams, G. & Son . .	Wadley House, Faringdon, Berks	1	0	0
Adams, R. and H. (Ld.) .	10, Queen Square, Bristol . .	1	0	0
Adeane, C. R. W. . .	Babraham, Cambridge . . .	1	0	0
†Aitken, G. H. . . .	Longleat Estate Office, Warminster	..		
Akers, E.	St. Fagans, Cardiff . . .	1	0	0
Alexander, D. . . .	Cardiff	1	1	0

Name.	Residence.	£	s.	d.
Alexander, H. G.	Dinas Powis, Cardiff	1	1	0
†Allen, James D.	Springfield House, Shepton Mallet		..	
Allen, W. T.	West Bradley, Glastonbury	1	0	0
Allin, Mrs. N.	Townsend Manor Farm, Over Wallop, Stockbridge	1	0	0
Allix, C. I. L.	St. Germans, Cornwall	1	0	0
Allsebrook, A.	Link Elm, Malvern Link	1	1	0
Ames, F.	Hawford Lodge, Worcester	1	0	0
Andrews, S. Fox	Union Street, Bath	1	0	0
Anglo-Continental Guano Works	Dock House, Billiter Street, E.C.	1	0	0
Anglo-Swiss Condensed Milk Company	Chippenham	1	0	0
Arnott, G. C.	69, Fenchurch Street, London, E.C.	1	0	0
†Ashcomb, Lord	Denbies, Dorking		..	
†Ashcroft, W.	13, The Waldrons, Croydon		..	
Ashford, E. C., M.D.	The Moorlands, Bath	1	0	0
*Astor, Waldorf	Cliveden, Taplow, Bucks	2	0	0
Augustein, J. R.	Holbrook House, Wincanton	1	0	0
Aungier, J.	Lynwick, Rudgwick	1	0	0
†Avebury, Lord	High Elms, Hayes, Kent		..	
†Aveling, Thomas L.	Rochester		..	
Avent, F. H.	Metal Exchange Buildings, Swansea	1	0	0
Avon Manure Company (Ld.)	St. Philip's Marsh, Bristol	1	0	0
Badcock, H. Jefferies	Broadlands, Taunton	1	0	0
Bainbridge, Mrs. R. C.	Elfordleigh, Plympton, South Devon	1	0	0
Baker, G. E. Lloyd	Hardwicke Court, Gloucester	1	0	0
†Baker, M. G. Lloyd	The Cottage, Hardwicke, Glos.		..	
†Baker, L. J.	10, Ennismore Gardens, London, S.W.		..	
Balston, R. J.	Bilsington Priory, Ashford, Kent	1	0	0
*Balston, W. E.	Barvin, Potters Bar, Herts	2	0	0
Bamfords (Ltd.)	Uttoxeter	1	0	0
*Bannatyne, J. F.	Haldon, Exeter	2	2	0
Barford and Perkins (Ltd.)	Peterborough	1	0	0
Barham, G. T.	Sudbury Park, Wembley, Middlesex	1	0	0
Baring, Hon. A. H.	The Grange, Alresford, Hants	1	0	0
*Barker-Hahlo, H.	Camerton Court, Bath	2	0	0
Barlow, Sir J. Emmott, Bart., M.P.	Torkington Lodge, Hazel Grove, near Stockport	1	0	0
Barrett, Major William	Moreden, North Curry, Taunton	1	0	0
Barrett, Col. W.	Moreden, Taunton	1	0	0
Barstow, J. J. J.	The Lodge, Weston-super-Mare	1	1	0

Name.	Residence.	Subscriptions. £	s.	d.
Barton, D. J.	. . . .	0	10	0
Bassett, A. F.	Tehidy, Camborne, Cornwall	1	0	0
Bates, W. J. & Co.	Victoria Iron Works, Denton, Manchester	1	0	0
*†Bath, Marquis of	Longleat, Warminster		..	
Bath and Somersetshire Dairy Co. (Ltd.)	Bath	1	0	0
Bath and Wells, The Bishop of	The Palace, Wells	1	1	0
Bath Gas Company	Bath	1	0	0
†Bathurst, C., M.P.	Lydney Park, Glos.		..	
Batten, Col. Cary	Abbotsleigh, Bristol	1	0	0
Batten-Pooll, R. H.	Road Manor, Bath	1	0	0
†Baxendale, J. Noel	Froxfield Green, Petersfield		..	
Bayly, J.	Highlands, Ivybridge, S. Devon	1	0	0
Beauchamp, E. B.	Trevince, Redruth	1	0	0
Beauchamp, F. B.	Woodborough House, Peasedown St. John, Bath	1	1	0
*Beaufort, Duke of	Badminton, Chippenham	2	2	0
Beaufoy, M. H.	Coombe Priory, Shaftesbury	1	0	0
Bennett, Brothers	*Journal* Office, Salisbury	1	1	0
Bennett, R. A.	Thornbury, Glos.	1	0	0
Bennetts, J. M.	Killaganoon, St. Feock, Cornwall	1	1	0
Bentall, Edward H. & Co.	Heybridge, Maldon, Essex	1	0	0
Benyon, H. A.	Englefield House, Reading	1	1	0
*Benyon, J. Herbert	Englefield House, Reading	5	0	0
Beor, H.	Caswell, near Swansea	1	0	0
Berryman, F. H.	Field House, Shepton Mallet	1	1	0
Best, Capt. T. G.	East Carleton Manor, Norwich	1	0	0
†Best, Capt. W.	Vivod, Llangollen, North Wales		..	
Best, Hon. J. W.	Charlton House, Ludwell, Salisbury	1	0	0
Beynon, J. W.	16, Mount Stuart Square, Cardiff	1	1	0
Birmingham, C.	Holnicote, near Minehead	0	10	0
†Blackburn, H. P.	Donhead Hall, Salisbury		..	
Blackstone & Co. (Ltd.)	Rutland Iron Works, Stamford	1	1	0
Blake, Col. M. Lock	Bridge, S. Petherton	1	0	0
Blathwayt, R. W.	Dyrham Park, Chippenham	1	1	0
Blinman & Miles	Farington Gurney, nr. Bristol	1	0	0
Board, R. J.	Skinner, Board & Co., Rupert St., Bristol	1	0	0
Bolden, Rev. C.	Preston Bissett, Buckingham	1	0	0
Bolitho, R. F.	Ponsandane, Penzance	1	1	0
Bolitho, T. B.	Trewidden, Penzance	1	0	0
Bolitho, T. R.	Trengwainton, Hea Moor, Cornwall	1	1	0
Bond, E. (W. Evans & Co.)	Hele, Cullompton	1	0	0
Boscawen, Rev. A. T.	Ludgvan Rectory, Long Rock, R.S.O., Cornwall	1	0	0
Boscawen, Hon. John R. de C.	Tregye, Perranwell, Cornwall	1	1	0

Name.	Residence.	Subscriptions. £	s.	d.
Boscawen, Townshend E.	2, Old Burlington St., London, W.	1	0	0
Bouverie, Hon. Mrs. Pleydell	Coleshill, Highworth, Wilts . .	1	1	0
Bouverie, H. P.	Brymore, Bridgwater . . .	1	0	0
†Bowen-Jones, Sir J., Bart.	The Woodlands, Bicton, near Shrewsbury	..		
†Bowerman, Alfred . .	Capton, Williton, Somerset . .	..		
Boyle, Capt. M. . .	The Manor, Steeple Fitzpaine, Taunton	1	0	0
Braby, F. & Co. . .	Ashton Gate Works, Bristol .	1	0	0
Bradford, F. . . .	Lilleshall, Swansea . . .	1	0	0
Bradford, Mrs. F. . .	Lilleshall, Swansea . . .	1	0	0
Bradford, Thomas & Co. .	Salford, Manchester . . .	1	0	0
Brand, Admiral Hon. T. S.	Glynde, Lewes, Sussex . . .	1	0	0
†Brassey, A. . . .	Heythrop, Chipping Norton . .	..		
*†Brassey, H. L. C. . .	Apethorpe Hall, Wansford, Northants	..		
Bridges, J. H.	Ewell Court, near Epsom . .	1	1	0
†Brinkley, Rev. W. F. B. .	The Vicarage, Abbots Leigh, Bristol	..		
Bristol Times and Mirror, Proprietors of . .	Bristol	1	0	0
Bristol Wagon and Carriage Works Co. (Ltd.) . .	Lawrence Hill, Bristol . . .	1	1	0
Britten, Forester . .	Kenswick Manor, Worcester . .	1	0	0
†Broadmead, W. B. . .	Enmore Park, Bridgwater . .	..		
†Brocklehurst, H. D.. .	Sudeley Castle, Winchcombe .	..		
Brockman, F. D. . .	Beach Borough, Hythe, Kent .	1	0	0
Broderip, E. . . .	Cossington, Somerset . . .	1	0	0
Brown, F. E. . . .	1,403 Neath Road, Swansea . .	1	0	0
Browning, Albert, M.A. .	The Homestead, Combe Park, Bath	1	1	0
Bruford, R.	Nerrols, Taunton	1	0	0
†Buckingham, Rev. Preb. .	The Rectory, Doddiscombsleigh, Exeter, Devon	..		
Buck, D.	White House, Little Mill, Pontypool	1	0	0
Buckley, W.	Moundsmere Manor, Basingstoke .	1	0	0
Budd, Felix S. . . .	Clarendon House, Stow Park, Newport, Mon.	1	0	0
Budd, J. E.	Tidebrook Manor, Wadhurst, Sussex	1	0	0
Burghclere, Lord . .	48, Charles Street, London, W. .	1	0	0
Burnard, R.	Cattedown, Plymouth . .	1	0	0
Burrell, C. and Sons . .	St. Nicholas Works, Thetford .	1	0	0
†Burrell, Sir C. R., Bart. .	Knepp Castle, Sussex . . .	..		
Burton, J. H., M.Sc. . .	County Education Offices, Weston-super-Mare	1	1	0
†Bush, H. G. . . .	Old Manor House, Keynsham . .	..		
Bush, Mrs. L. E. . .	St. Mary's, Atlantic Road South, Weston-s-Mare	1	1	0
Buswell, C. and W. . .	Torquay	1	0	0
*Bute, The Marquis of .	The Castle, Cardiff . . .	2	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Butland, B.	Leigham, Plympton	1	0	0
Butler, I.	Panteg House, near Newport, Mon.	1	0	0
Butters, G.	Hill House, Newton, Leominster	1	0	0
Butterworth, R. W.	21, St. James's Square, Bath	1	0	0
Byng, Col. Hon. C.	Deerhurst, Lyndhurst, Hants	1	1	0
Cadogan, Earl, K.G.	Culford, Bury St. Edmunds	1	1	0
Cæsar, H. and J.	Knutsford, Cheshire	1	0	0
Campbell, J.	93, Mansel Street, Swansea	1	0	0
Candy, T. C.	Woolcombe, Cattistock, Dorset	1	0	0
Carew, C.	Collipriest, Tiverton	1	0	0
Carnarvon, Earl of	Highclere Castle, Newbury	1	1	0
*Carr, Jonathan	Wood House, Twerton-on-Avon, Bath	2	2	0
Carr, Richardson	Estate Office, Tring Park, Herts	1	0	0
†Carruthers W., F.R.S.	14, Vermont Road, Norwood, London, S.E.	..		
†Carter, E.	East Upton, Ryde, Isle of Wight	..		
Carter, G. V.	Waterston Manor, Dorchester	1	1	0
Carter, J. & Co.	238, High Holborn, London	1	0	0
Cartwright, T. G.	30, Beaufort Gardens, London, S.W.	1	0	0
Carver, H. R.	West House, Chilton Polden, Bridgwater	1	0	0
Cary, Edmund	Pylle, Shepton Mallet	0	10	0
†Cary, John	The Priory, Shepton Mallet	..		
†Cary, W. H.	Mantua, Steeple Ashton, Trowbridge	..		
Cascajo, J.	Fair View, Dinas Powis, Cardiff	1	0	0
Cattybrook Brick Co. (Ltd.)	Baldwin Street, Bristol	1	0	0
Cave, Sir C., Bart.	Lidbury Manor, Sidmouth	1	0	0
Cave, C. H.	Rodway Hill House, Mangotsfield, Bristol	1	0	0
Cazalet, W. M.	Fairlawne, Tonbridge	1	0	0
Cecil, Lord A.	The Mount, Lymington, Hants	1	0	0
Chadwyck-Healey, Sir C. E. H., K.C.B., K.C.	Wyphurst, Cranleigh	1	1	0
Chapman, W. W.	Mowbray House, Norfolk Street, Strand, London, W.C.	1	1	0
Charles, W.	1, Royal Crescent, Bath	1	0	0
Chetwynd, Viscount	Wyndthorpe, near Doncaster	1	0	0
Chichester, Major C. H.	Hall, Bishops Tawton, Barnstaple	1	0	0
†Chick, J. H.	Wynford Eagle, Maiden Newton, Dorset	..		

Name.	Residence.	Subscriptions. £	s.	d.
†Chick, W. D.	Compton Valence, Dorchester	..		
Childs, C., M.D.	Boscarn, Looe, R.S.O., Cornwall	1	0	0
Christie, A. L.	Tapeley Park, Instow, N. Devon	1	1	0
Churchill, The Viscount, G.C.V.O.	Carlton Club, Pall Mall, London	1	0	0
†Churchward, F.	Hill House, Stoke Gabriel, near Totnes	..		
*Clarendon, Earl of	The Grove, Watford	2	2	0
Clark, H. A.	Hinton Field, Hinton Charterhouse, Bath	1	0	0
†Clark, J. J.	Goldstone Farm, Hove, Sussex (Hon. Local Sec., 1885)	..		
Clark, W. S.	Street, Glastonbury	1	0	0
Clark, W. H.	Rutland Cottage, Combe Down, Bath	1	1	0
Clarke, J. B.	Overleigh House, Street, Somerset	1	0	0
Clerk, Lieut.-Col. R. M.	Charlton House, Shepton Mallet	1	0	0
*Clifden, Viscount	Lanhydroc, Bodmin	2	0	0
*Clifford, Lord	Ugbrook, Chudleigh	2	2	0
Clinton, Lord	Heanton Satchville, Dolton, N. Devon	1	0	0
Clutton, R. W.	Hartswood, Reigate	1	0	0
Coaker, J.	Blagdon Barton, Paignton, Devon	1	0	0
Cobb, H. M.	Higham, Rochester	1	0	0
Cobb, R.	Larkin Hall, near Rochester	1	0	0
Coleridge, Hon. G.	Clophill, Ampthill, Beds.	1	0	0
Coles, C.	Manor House, Winterbourne Stoke, Salisbury	1	0	0
Collins, D.	Newton Ferrars, Callington, Cornwall	1	1	0
Collins, J. S.	St. George's Lodge, Oldfield Park, Bath	1	1	0
Colman, Sir J., Bart.	Gatton Park, Surrey	1	0	0
Colmer, Jas. (Ltd.)	Union Street, Bath	1	0	0
*Colston, E.	Roundway Park, Devizes	2	2	0
Colthurst, Symons & Co., (Ltd.)	Bridgwater	1	0	0
Colville, H. K.	Loders Court, Bridport	1	0	0
Cook, R.	Widhayes, Tiverton	1	0	0
†Cookson, H. T.	Sturford Mead, Warminster	..		
Cooling, G. and Sons	Northgate Street, Bath	1	1	0
Cooper, Sir G., Bart.	Hurcley Park, Winchester	1	0	0
Cope, W.	Southerndown, Glam.	1	1	0
Corbet, E. W. M.	Bute Estate Office, Cardiff	1	1	0
Corbett, Thomas	Perseverance Iron Works, Shrewsbury	1	0	0
Corker & Bevan	Swansea	1	1	0
†Cork and Orrery, The Earl of	22, Ryder Street, London, S.W.	..		

Name.	Residence.	Subscriptions. £ s. d.
†Corner, H. W.	Manor House, Inglescombe, Bath	..
†Cornwallis, F. S. W.	Linton Park, Maidstone	..
Cory, Sir Clifford	Llantarnam Abbey, Mon.	1 0 0
Cottam, C. D.	The Old Rectory, Wilton, near Salisbury	1 0 0
†Cotterell, Sir J. R. G., Bart.	Garnons, Hereford	..
Coultas, J. R.	Perseverance Iron Works, Grantham	1 0 0
†Courage, Raymond	Shenfield Place, Brentwood, Essex	..
†Coussmaker, Lt.-Col. G.	Westwood, Normandy, Guildford, Surrey	..
*Coventry, The Earl of	Croome Court, Worcester	2 0 0
Cox, B.	Pwlpen Farm, Christchurch, Newport, Mon.	0 10 0
Cox & Sons	47, City Road, Cardiff	1 0 0
Crawshay, W. T.	Caversham Park, Reading	1 0 0
Crewdson, J. D.	Syde, near Cheltenham	1 0 0
Crick, Thomas	Great Ash, Winsford, Dulverton	0 10 0
Cridlan, J. J.	Maisemore Park, Gloucester	1 0 0
Crutchley, P. E.	Limminghill Lodge, Ascot	1 0 0
Cuming, A. P.	Moreton Hampstead, Devon	1 0 0
Cundall, H. M., I.S.O., F.S.A.	Richmond Hill, Surrey	1 0 0
†Curre, E.	Itton Court, Chepstow	..
Currie, L.	Minley Manor, Farnborough, Hants	1 0 0
Currie, W. C.	Seacombe, Liverpool	1 0 0
Dairy Supply Company (Ltd.)	Museum St., Bloomsbury, London	1 0 0
†Daniel, H. T.	The Red House, Cannington, Bridgwater	..
Daniel, Thos. C.	Stuckeridge, Bampton, North Devon	1 1 0
Darby, A. E. W.	Little Ness, Shrewsbury	1 0 0
Darby, E.	Liscombe, Dulverton	1 0 0
†Darell, D.	Hillfield House, Stoke Fleming, near Dartmouth	..
†Davenport, Rev. Geo. H.	Foxley, Hereford	..
†Davey, J. Sydney	Brockym, Cury - Cross - Lanes, Cornwall	..
Davey, Sleep, & Co. (Ltd.)	Excelsior Plough Works, Plymouth	1 0 0
David & David	Old Bank Chambers, 27, High Street, Cardiff	1 0 0

Name.	Residence.	Subscriptions. £	s.	d.
Davie, Sir W. A. F., Bart., C.B.	Creedy Park, Crediton	1	0	0
Davies, D.	The Borough Stores, College Street, Swansea	1	1	0
Davis, Col.	Salt Hill House, near Slough	1	0	0
Davis, F. L.	7, Bute Crescent, Cardiff	1	1	0
†Davis, H. J.	Sutton Montis, Sparkford, S.O., Somerset	..		
Davis & Co.	75, George Street, Oxford	1	0	0
Daw, J. E.	Exeter	1	1	0
Dawson, W. and F.	Market Place, Bath	1	0	0
Day and Sons (Ltd.)	Crewe	1	0	0
†Deacon, W. S.	Poynters, Cobham, Surrey	..		
De Bertodano, B.	Cowbridge House, Malmesbury	1	0	0
De Blaquiere, Lord	3, The Circus, Bath	1	0	0
De Hamel, E.	Middleton Hall, Tamworth	1	0	0
De Knoop, J.	Calveley Hall, Tarporley	1	0	0
Demuth, R. H.	. . . .	1	0	0
Dening, C. & Co.	Chard, Somerset	1	0	0
Dennis, S.	Latton, Cricklade, Wilts	1	0	0
Denny, G. A.	. . . .	1	0	0
†Devas, H. G.	Hartfield, Hayes, Kent	..		
*Devon, The Earl of	Powderham Castle, Devon	2	0	0
*Devonshire, Duke of	Chatsworth, Derbyshire	5	0	0
Dew, W. S.	Newton St. Loe, Bristol	1	0	0
De Weyer, Col. Victor Bates Van	New Lodge, Winchfield, Windsor	1	1	0
Dickinson, W.	Kingweston, Somerton	1	1	0
Dickson and Robinson	Cathedral Street, Manchester	1	1	0
Dickson's (Ltd.)	Chester	1	1	0
†Digby, Lord	Minterne, Cerne Abbas	..		
Digby, F. J. B. Wingfield	Sherborne	1	0	0
†Dobson, H. V.	Perridge House, Shepton Mallet	..		
Dodington, R. M.	Horsington Park, Templecombe	1	1	0
Dormer, Capt. C. W. C.	Rousham, Oxford	1	0	0
Drummond, Col. F. D. W.	Cawdor Estate Office, Carmarthen	1	0	0
Drummond, H. W.	3, Bryanston Square, London, W.	1	0	0
Duchesne M. C.	Farnham Common, Slough, Bucks.	1	0	0
*Ducie, Earl of	Tortworth Court, Falfield, R.S.O., Glos.	2	0	0
Dugdale, J. M.	Llwyn, Llanfyllin, near Oswestry	1	0	0
†Dunboyne, Lord	Greendale, Clyst St. Mary, Exeter	..		
Duncan, R.	Rhoose, near Barry	1	0	0
Duncombe, Col. W. H. O.	Waresley Park, St. Neots	1	1	0
Dunlop, I. M.	Avonhurst, Sneyd Park, Bristol	1	0	0
*Dunraven, Earl of	22, Norfolk Street, Park Lane, London, S.W.	2	2	0

Name.	Residence.	Subscriptions. £	s.	d.
Dyer John	1, Richmond Villas, Swansea	1	0	0
*Dyke, Rt. Hon. Sir W. Hart, Bart.	Lullingston Castle, Eynsford	2	2	0
Eagle Range and Gas Stove Company (Ltd.)	Catherine Street, Aston, Birmingham	1	0	0
Eastwood, A. C.	Leigh Court, Taunton	1	0	0
*†Eastwood, J. E.	Enton, Witley, Surrey	..		
Eavis, W. G.	Worthy Farm, Pilton, Shepton Mallet	1	0	0
Economic Fencing Company (Ltd.)	Billiter House, Billiter Street, London, E.C.	1	0	0
Eden, R. H. H.	Sherborne, Dorset	1	0	0
†Edgcumbe, Sir Robert Pearce	. . . .	..		
Edmonds, W.	Wiscombe Park, Colyton	1	0	0
†Edmondson, A.	Church Farm, Dry Sandford, Abingdon	..		
Edridge, Sir. F., Bart.	Addiscombe Court, Croydon	1	1	0
Edwards, A. P.	Gogs House, Wedmore, Somerset	1	1	0
Edwards, C. L. Fry	The Court, Axbridge, Somerset	1	0	0
Edwards, Mrs.	Haresfield, Mumbles, Glam.	1	0	0
Edwards, W.	Haresfield, Mumbles, Glam.	1	0	0
Edwards, W. H. G.	Butcombe Court, Wrington	1	0	0
Eldridge, Pope & Co.	Dorchester	1	0	0
Elliott, Sir Thomas H., Bart.	4, Whitehall Place, London, S. W.	1	1	0
Elliott, T. M.	Biddestone, Chippenham	1	0	0
Elston, J.	Echo Villa, Batheaston, Bath	1	0	0
Elton, B. A.	Clevedon Court, Somerset	1	0	0
*Elton, Sir E., Bart.	Clevedon Court, Clevedon	2	2	0
Enderby, Miss E. M.	Beckington, Bath	1	1	0
Enfield, Viscount	Dancer's Hill, Barnet	1	0	0
Ensor. T. & Sons	Auctioneers, Dorchester	1	0	0
Errington, R.	Victoria Mills, Sunderland	1	0	0
Esdaile, C. E. T.	Cothelstone House, Taunton	1	0	0
Ettle, J., F.R.H.S.	37, Stanley Grove, Weston-super-Mare	1	1	0
Evans, H. M. Glynn	Plasissa, Llangennech, Carmarthenshire	1	0	0
Evans, H. R.	Court of Noke, Pembridge, Herefordshire	1	0	0
†Evan-Thomas, Commander A.	Caerwnon, Builth Wells, R.S.O.	..		
†Eve, Mr. Justice	Pullabrook, Bovey Tracy, South Devon	..		
Evelyn, Mrs.	Wotton House, Nr. Dorking	1	0	0

Name.	Residence.	£	s.	d.
*Falmouth, Viscount	Tregothnan, Truro	2	0	0
Fardoe, M.	Woodram Farm, Pitminster, Taunton	1	0	0
†Farmer, S. W.	Little Bedwyn, Wilts		..	
†Farwell, E. W.	11, Laura Place, Bath		..	
†Farwell, Right Hon. Sir Geo.	15, Southwell Gardens, London, S.W.		..	
Faudel-Phillips, H.	Mapleton Stud, Edenbridge, Kent	1	0	0
Fellowes, Right Hon. A. E.	Honingham, Norfolk	1	0	0
Fenton, A. D.	Maristow, Roborough, S. Devon	0	10	0
Ferrand, G. F.	Morland Hall, Alton, Hants	1	0	0
Finlay, Col. Alexander	Little Brickhill, Bletchley, Bucks	1	0	0
Finn, L. & G.	Westwood Court, Faversham	1	0	0
Fisher, Col. H. Oakdene	Ty Mynddi, Radyr, near Cardiff	1	0	0
*Fitzgerald, Sir Maurice, Bt. (The Knight of Kerry)	Buckland Faringdon, Berks	2	0	0
*Fitzhardinge, Lord	Cranford House, Hounslow	2	0	0
Fleming, J. Willis	Stoneham Park, Eastleigh, Hants	1	0	0
Fletcher, E. E.	224, Oxford Street, Swansea	1	1	0
†Fletcher, Lionel J. W.	West Farleigh, Maidstone		..	
Flower, James	Chilmark, Salisbury	1	0	0
Flower, W. R.	West Stafford, Dorchester	1	0	0
Ford, W. A.	Eaton Grove, Swansea	1	1	0
*†Forester, Capt. F. W.	Saxilbye Park, Melton Mowbray		..	
Forrest, Col. W.	St. Fagan's, Cardiff	1	0	0
Forster, J. C.	Clatford Mills, Andover	1	0	0
†Fortescue, J. B.	Boconnoc, Lostwithiel, Cornwall		..	
Fortt, A. H.	Hatfield House, Hatfield Place, Bath	1	0	0
Foster-Harter, G. L.	Salperton Park, Compton Abdale, R.S.O., Glos.	1	0	0
Four Oaks Spraying Machine Co. (Ltd.)	Four Oaks Works, Sutton Coldfield	1	0	0
Fowler & de la Perrelle	Porter's Lane, Southampton	1	0	0
†Fowler, G.	Claremont, Taunton		..	
Fowler, J. & Co. (Ltd.)	Leeds	1	0	0
Fownes, Col.	. . . .	1	0	0
Fox, Brothers & Co.	Wellington, Somerset	1	1	0
Fox, C. L.	Rumwell Hall, Taunton	1	0	0
Fox, Dr. A. E. W.	Kilkenny House, Sion Hill, Bath	1	1	0
Fox, Mrs. A.	Brislington House, near Bristol	1	0	0
†Fox, Robert	Grove Hill, Falmouth		..	
Fox, R. W.	Grimstone, Horrabridge, Devon	1	0	0
Foxcroft, C. T.	Hinton Charterhouse, Bath	1	1	0
*Fremlin, W. T.	Milgate Park, Maidstone	2	0	0
Fry, A. M.	8, Sion House, Clifton, Bristol	1	1	0
Fry, H. A.	19, Monmouth Place, Bath	1	1	0

Name.	Residence.	£	s.	d.
*Fry, J. F.	Ford Abbey, Chard	2	0	0
*Fry, J. S. & Sons (Ltd.)	Union Street, Bristol	2	2	0
Fuller, E. R.	Islay Lodge, Pulteney Road, Bath	1	0	0
†Fuller, G. Pargiter	Neston Park, Corsham		..	
*Fuller, Sir J. M., Bart.	Neston Park, Corsham	2	0	0
Fuller, S. and A.	Bath	1	0	0
Fursdon, E. S.	St. Martin's, Kingskerswell, Devon	1	1	0
Fyson & Co. (Ltd.)	Union Street, Bath	1	1	0
Gardiner, Sons & Co.	Nelson Street, Bristol	1	1	0
Garne, W.	Aldsworth, Northleach	1	1	0
Garne, W. T.	Aldsworth, Northleach	1	1	0
*Garratt, Lt.-Col. T. A. T.	Bishop's Court, Exeter	2	2	0
Garrett, W.	Backwell Hill House, West Town, R.S.O., Somerset	1	0	0
Garton, Jas.	Clarendon Park, Salisbury	1	0	0
Gear, W. H.	Bridge Street, Bath	1	1	0
*†George, William E., J.P.	Downside, Stoke Bishop, Bristol		..	
Gibbins, T.	Glynfelin, Neath	1	1	0
Gibbons, George	Tunley Farm, near Bath	1	0	0
†Gibbons, H.	Church Farm, Clutton, Bristol		..	
Gibbons, P., J.P.	Keynsham	1	1	0
Gibbs, A. H.	Pytte, Clyst St. George, Topsham, Devon	1	0	0
*†Gibbs, G. A., M.P.	Tyntesfield, Bristol		..	
†Gibbs, H. M.	Barrow Court, Flax Bourton, Bristol		..	
Gibson, J. T.	Claverham, near Yatton	1	1	0
Gill, P. O.	Uplands, Wrington, Somerset	1	0	0
Gillingham, J. and Son	Prospect House, Chard	1	0	0
†Gladstone, J.	Bowden Park, Chippenham		..	
Glantawe, Lord	The Grange, Swansea	1	0	0
Glyn, R. F.	The Cross House, Fontmell Magna, Shaftesbury	1	1	0
*Glyn, Sir Richard G., Bart.	Gaunt's House, Wimborne	2	2	0
Godfrey, W. J.	Exmouth	1	1	0
†Godman, C. B.	Woldringfold, Horsham		..	
Godman, J.	The Raswells, Hascombe, Godalming	1	0	0
†Goldney, Sir Prior, Bart., C.B.	Derriads, Chippenham		..	
Gomer, W.	Killerton Estate Office, Broadclyst, Exeter	1	0	0
Goodden, J. R. P.	Compton House, Sherborne	1	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Goodman, A. & Co.	3, Hammett Street, Taunton, and Broad Street House, London, E.C.	1	0	0
Goodrop, A.	Wick Farm, Combe Hay, Bath	1	0	0
Gordon, G. H.	The Barn House, Sherborne	1	0	0
Goring, C.	Wiston Park, Steyning	1	0	0
†Gorringe, Hugh	Kingston-by-Sea, Brighton	..		
Grace, A.	39, Welsh Back, Bristol	1	0	0
Grant, C. E.	Bursar, King's College, Cambridge	1	0	0
Grant, W. J.	Pentonville, Newport, Mon.	1	0	0
Greaves, R. M.	Wern, Portmadoc, North Wales	1	0	0
†Greenall, Mrs. C. E.	The Manor, Carltone Scroop, Grantham	..		
†Greenall, Sir G., Bart.	Walton Hall, Warrington	..		
Greenslade, W. R. J.	Fairfield, Trull, Taunton	1	0	0
Greenway, W.	Halse, Taunton	1	0	0
Greenwell, Sir W., Bart.	Marden Park, Woldingham, Surrey	1	0	0
Gregor, T.	11, Sketty Road, Swansea	1	0	0
Gregory, W.	Wellington, Somerset	1	0	0
†Guest, Lady Theodora	Inwood, Templecombe	..		
Guille, H. C. de Stevens	St. George, Castel, Guernsey	1	0	0
Guise, Sir W. F., Bart.	Elmore Court, Gloucester	1	0	0
Gunning, A. E.	Fosse Farm, Combe Hay, Bath	1	0	0
Gunther, C. E.	Tongswood, Hawkhurst, Kent	1	0	0
Habgood, G.	Harley Lodge, Wimborne	1	0	0
Hall, A. C.	The Manor, Great Rollright, Chipping Norton	1	0	0
*Hambleden, Viscount	Greenlands, Henley-on-Thames	5	0	0
†Hambro, Sir Everard A.	Hayes Place, Beckenham, Kent	..		
Hancock, Rev. Prebendary F.	The Priory, Dunster, Somerset	1	0	0
Hancock, H. C.	The Court, Milverton, Taunton	1	0	0
Hancock, R. D., Mrs.	Halse, Taunton	1	0	0
Harbottle, E.	Topsham	1	0	0
Harding, C.	Upton Grove, Tetbury	1	0	0
Harding, R.	Fenswood Farm, Long Ashton, Bristol	1	0	0
Hardwick, E. A.	Kewstoke, Weston-super-Mare	1	0	0
Harpur, W.	Borough Engineer, Cardiff	1	0	0
Harris, C. & T. (Ltd.).	Bacon Curers, Calne, Wilts	1	0	0
Harris, H.	Singleton Park Farm, Sketty, S.O., Glam.	1	0	0
Harris, J. M.	Chilvester Lodge, Calne, Wilts	1	0	0
Harrison, D.	The Grove, Tenby	1	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Harrison, Miss	West Hay, Wrington	1	1	0
Harrison, McGregor & Co.	Leigh, Lancashire	1	0	0
Haversham, Lord	Trevina, Tintagel, Cornwall	1	0	0
Haward, T. W.	Brombil House, Margam, Port Talbot	1	1	0
Hawkins, A. W. Bailey	Stagenhoe Park, Welwyn, Herts	1	0	0
Hawkins, Mrs.	10, Portland Place, London, W.	1	1	0
†Haydon, Lt.-Col. W. H.	Maidford, Malmesbury, Wilts	..		
Hayes, F. J.	West Pennard, Glastonbury	1	0	0
Heathcoat-Amory, Sir I. M., Bart.	Hensleigh, Tiverton, Devon	1	0	0
Hember, S. H.	Queen Charlton, near Bristol	1	0	0
†Henderson, A. N.	Street Ashton House, Lutterworth	..		
Henderson, Sir A., Bart.	Buscot Park, Faringdon, Berks	1	1	0
Heneage, Capt. R.N.	Parc le Breos, Penmaen, Glam.	1	0	0
Henry, Lt.-Col. F.	Elmstree, Tetbury	1	0	0
Hepple, E. M.	Camerton, near Bath	1	0	0
Herbert, Maj.-Gen. Sir Ivor, Bart., M.P.	Llanarth Court, Raglan, Mon.	1	0	0
Hesse, F. W.	Bloomfield House, Bloomfield Road, Bath	1	0	0
†Hewitt, G. Southby.	Day, Son & Hewitt, 22, Dorset Street, London, W.	..		
Hick, W. A.	Wayfield, Batheaston, Bath.	1	0	0
Hicks, Mrs. R.	Treganhoe, Newbridge, R.S.O., Cornwall	1	0	0
Hignett, G.	Hodshill, South Stoke, Bath	1	0	0
†Hill, B. H.	Uphill, Weston-super-Mare	..		
Hill, Edward	Stratton House, Evercreech	1	0	0
Hill, H.	Paulton, near Bristol	1	1	0
Hill, V. T.	Mendip Lodge, Langford, Bristol	1	1	0
Hill, W. B.	Underhill Farm, Cannock Road, Wolverhampton	1	0	0
Hill, Capt. W. J. M.	Westwood House, West Bergholt, Essex	1	0	0
Hippisley & Sons	Wells, Somerset	1	0	0
Hippisley, R. J. B.	Ston Easton Park, Bath	1	0	0
Hiscock, A.	Motcombe, Dorset	1	0	0
†Hoare, Sir H. H. A., Bart.	Stourhead, Zeals, S.O., Wilts.	..		
Hoare, H. C.	Stourhead, Bruton	1	0	0
*Hobhouse, Rt. Hon. H.	Hadspen House, Castle Cary.	2	0	0
†Hoddinott, S.	Worminster, Shepton Mallet	..		
Holder, H. Newton	c/o Thos. Bigg (Ltd.), 11½, Great Dover Street, London, S.E.	1	0	0
Holland and Coombs	Bristol	1	0	0
Holt Needham, O. N.	Barton Court, Colwall, near Malvern	1	0	0
†Hooper, R. N.	Stanshawes Court, Chipping Sodbury	..		

Name.	Residence.	Subscriptions. £	s.	d.
†Hope, W. H. B.	Eastwood, East Harptree, Bristol	..		
Hopper, H. R.	Merryweather & Sons, Greenwich Road, London, S.E.	1	1	0
†Horner, Sir J. F. Fortescue	Mells Park, Frome	..		
Hornsby and Sons (Ltd.)	Grantham, Lincoln	1	0	0
Horton, Rev. Le G.	Wellow Vicarage, Bath	1	1	0
Hosegood, A. W.	Williton, Taunton	1	0	0
Hosegood, Obed., jun.	Dillington, Ilminster	0	10	0
Hosken, W. J.	Pulsack, Hayle, Cornwall	1	1	0
Hoskin, E. H.	Cartuther Barton, Liskeard	1	0	0
†Hoskins, R. J.	Beard Hill, Shepton Mallet	..		
Hoskyns, H. W. P.	North Perrott Manor, Crewkerne, Somerset	1	0	0
Houldsworth, A. F.	Widcombe, Kingsbridge, Devon	1	1	0
Howard, J. and F.	Britannia Works, Bedford	1	0	0
Hudson, E. V.	Wolseley Works, Witton, Birmingham	1	0	0
†Hughes, A. E.	Wintercott, Leominster	..		
Humphries, Sidney	Eastfield Lodge, Westbury-on-Trym, Bristol	1	1	0
Hunter, Sir Charles, Bart., M.P.	1, West Eaton Place, London, S.W.	1	0	0
Hunter, J. (Ltd.)	Seed Merchants, Chester	1	0	0
†Hurle, J. C.	Brislington Hill, Bristol	..		
Hurst and Son	152, Houndsditch, London	1	0	0
Hussey, J. W.	Bouverie House, Exeter	1	0	0
†Hylton, Lord	Charlton, near Radstock	..		
Ibbotson, R.	The Hawthorns, Knowle, Warwickshire	1	0	0
*Ilchester, Earl of	Melbury, Dorchester	2	2	0
Imbert-Terry, H. M.	Strete Raleigh, Whimple	1	0	0
Imperial Accident Insurance Co.	17, Pall Mall, East, London, S.W.	1	0	0
Innes, G. P. Mitchell	Craig-yr-Haul, Castleton, Cardiff	1	0	0
International Harvester Co. (Ltd.)	80, Finsbury Pavement, London, E.C.	1	0	0
*Irby, Hon. G. N.	Porthamel, Llanfair, P.G., Anglesey	2	0	0
Ireland, A. C.	Brislington Hall, near Bristol	1	1	0
Irvine, H. O.	Southerndon, Bridgend, Glam.	1	0	0
*Islington, Lord	Hartham Park, Corsham	2	0	0
*Ismay, J. H.	Iwerne Minster, Blandford, Dorset	2	0	0
Jackman, Percy	Pulteney Hotel, Bath	1	0	0
Jackson, Sir H. M., Bart.	Llantillio Court, Abergavenny	1	0	0

Name.	Residence.	£	s.	d.
Jardine, E., M.P.	The Park, Nottingham	1	1	0
Jarmain, T. M.	Haseley Iron Works, Tetsworth	1	1	0
Jefferis, Mrs.	Royal Refreshment Rooms, Bristol	1	0	0
Jenkins, D.	Flemingston Court, Cowbridge, Glam.	1	0	0
Jenkins, E.	c/o F. Capern, Lewin's Mead, Bristol	1	0	0
Jenkins, Captain Vaughan	St. Winifreds, Combe Down, Bath	1	0	0
Jenkins, W. H. P.	Frenchay Park, Bristol	1	0	0
*Jersey, Earl of	Middleton Park, Bicester, Oxon.	2	0	0
†Jervoise, Mrs. B. A. L.	Herriard Park, Basingstoke	..		
Jervoise, F. H. T.	Herriard Park, Basingstoke	1	1	0
Jeyes' Sanitary Compounds Company	Cannon Street, London, E.C.	1	0	0
John, E.	Cowbridge, Glamorgan	1	0	0
Johns, W. B.	25, Pargiter Road, Bearwood, near Birmingham	1	0	0
Jones, T. S.	Frondez, Radyr, Cardiff	1	0	0
Jones, W.	Penciseley, near Cardiff	1	0	0

Name.	Residence.	£	s.	d.
Keel, W. W.	Stanton Drew, Somerset	1	0	0
Keeling, G.	North Hill Farm, Dunkerton, Bath	1	0	0
Keene, James B. & Co.	*Journal* Office, Bath	1	0	0
Kekewich, T. H., J.P.	Peamore, Exeter	1	0	0
Kell & Co.	Gloucester	1	0	0
Kelly, Col. A. L.	Cadbury House, Wincanton, Somerset	1	0	0
Kelway, W.	Huish Episcopi, Langport	1	1	0
Kemble, C. A.	Hallatrow, Bristol	1	0	0
†Kemp, L. J.	Maer, Exmouth	..		
Kennaway, Rt. Hon. Sir J. H., Bart., M.P.	Escot, Ottery St. Mary	1	1	0
Kennaway, J.	Escot, Ottery St. Mary	1	0	0
†Kettlewell, W. W.	East Harptree Court, Bristol	..		
*Keyser, C. E.	Aldermaston Court, Reading	2	0	0
Keyworth, J. and H. & Co.	Tarleton Street, Liverpool	1	0	0
King, J., M.P.	Sandhouse, Witley, Surrey	1	0	0
King and Sons, R.	Milsom Street, Bath	1	1	0
King, W. E. M.	Donhead Lodge, Salisbury	1	0	0
Kingwell, H. J.	Great Aish, South Brent, S. Devon	1	0	0
Kinneir, H.	Redville, Swindon	1	0	0
Knight, S. J.	Walnut Farm, East Dundry, near Bristol	1	0	0
†Knollys, C. R.	Weekley, Kettering	..		
Knox, E.	Kilmersdon, Bath	1	1	0
†Kruse, W.	Perran Bay House, Perranporth, Cornwall	..		

Name.	Residence.	£	s.	d.
†Lake, C.	Oakley, Higham, Kent	..		
Lane, A. P.	Arthur's Club, St. James's, London	1	0	0
*Lansdowne, Marquis of	Bowood, Calne	2	0	0
Larkworthy, E. W.	Messrs. J. L. Larkworthy & Co., Worcester	1	0	0
†Latham, T.	Dorchester, Oxon	..		
Lawrey, A.	Varful, Ludgvan, Long Rock, R.S.O., Cornwall	1	0	0
Lear, F. G.	The Court Farm, Rodley, Westbury-on-Severn, Glos.	1	0	0
Lee, Major-Gen. H. H.	The Mount, Dinas Powis, Cardiff	1	0	0
Leeder, E. H.	Mount Pleasant House, Swansea	1	0	0
Lees, Sir T., Bart.	South Lychett Manor, Poole	1	1	0
Le Feuvre, F. V.	La Fosse, St. Peter's, Jersey	1	0	0
Legard, A. G.	Brow Hill, Batheaston, Bath	1	0	0
Lennard, Sir H., Bart.	Wickham Court, West Wickham, Kent	1	0	0
Lethbridge, Charles	Carlton Club, London, S.W.	1	0	0
Leverton, W. A.	Columb John Farm, Stoke Canon, Exeter	1	0	0
Leverton, W.	Woolleigh Barton, Beaford, North Devon	0	10	0
Lewis, Col. H.	Green Meadow, near Cardiff	1	1	0
Lewis, Wm. and Son	*Herald* Office, Bath	1	0	0
†Ley, John Henry	Trehill, Exeter	..		
†Leyland, C. J.	Haggerston Castle, Beal, Northumberland	..		
Liddell, C. O.	Shirenewton Hall, Chepstow	1	1	0
Liddon, E., M.D.	Silver Street House, Taunton	1	0	0
Linton, E. N.	Westgate Chambers, Newport, Mon.	1	0	0
Lipscomb, Godfrey	Margam Park, Port Talbot	1	0	0
Lister, R. A. & Co. (Ltd.).	Dursley, Glos.	1	1	0
†Lister, J. J.	Warninglid Grange, Haywards Heath	..		
Llewellyn, Lieut.-Col. A.	Writtenhall, Bewdley, Worcestershire	1	0	0
Llewellyn, Llewellyn T. E.	Hackwood, Basingstoke	1	1	0
*Llewelyn, Sir J. T. D., Bart.	Penllergaer, Swansea	2	2	0
*Lloyd, Herbert	Plas Cilybebyll, Pontardawe, R.S.O., Glam.	2	2	0
Lloyd, J. C.	Dinas, Brecon	1	0	0
Lock, B. J.	Tudney Farm, Ilminster	0	10	0
*†Long, Rt. Hon. Walter H., M.P.	Rood Ashton, Trowbridge	..		
Long, Col. William	Woodlands, Congresbury, Somerset	1	0	0
Longrigg, G. E.	Weston Lea, Bath	1	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Lopes, Sir H. Y. Buller, Bart.	Maristow, Roborough, Devon	1	0	0
Loram, Brothers	Cathedral Dairy, Exeter	1	1	0
Lovelace, T.	Bratton Court, Minehead, Somerset	1	0	0
Lubbock, Major G.	Greenhill, Warminster, Wilts	1	0	0
Lucas, Lord	Wrest Park, Ampthill	1	0	0
Ludlow, Lord	Hardenhuish, Chippenham	1	0	0
†Lutley, J. H.	Brockampton, Worcester	..		
Luttrell, Capt. A. F.	Court House, East Quantoxhead, Bridgwater	1	0	0
Luttrell, Claude M. F.	15, Gay Street, Bath	1	1	0
*MacAndrew, J. J.	Lukesland, Ivybridge	2	0	0
McCalmont, D. H. B..	Crockford's Hall, Newmarket	1	1	0
Macdonald, K.	5, Sion Hill, Bath	1	0	0
McIntosh, Mrs. C. M.	Havering Park, Havering Atte Bower, Essex	1	1	0
Major, H. J. and C. (Ltd.)	Bridgwater	1	0	0
Mallett, W. E.	The Octagon, Bath	1	0	0
†Mansell, A. E.	Mount Vernon, Melton Mowbray, Tasmania	..		
Marcus, M.	High Trees, Redhill, Surrey	1	0	0
Marden, E. D.	Marston House, Marston Magna, Bath	1	0	0
Marfell, R. H.	Great House Farm, Llangeview, Usk	1	0	0
Marken, E. R.	Henstaff Court, Pontyclun, R.S.O..	1	1	0
Marker, Richard	Combe, near Honiton	1	0	0
Marriner, C. F.	Thorpe Hall, Hasketon, Woodbridge, Suffolk	1	1	0
Marshall, L. H.	Chippenham	1	0	0
Marshall, Sons & Co. (Ld.)	Britannia Iron Works, Gainsborough	1	0	0
Martin, E. G. Bromley	St. Cloud, Callow End, Worcester	1	0	0
Martin, J.	Thorverton, R.S.O., Devon	1	0	0
Martin, L. J. (Associated Manufacturers' Assn.)	72-80, Mansell Street, Aldgate, London, E.C.	1	0	0
Martin and Carnes	Taunton	1	1	0
Martyn, G.	Tremeddan, Liskeard, Cornwall	1	1	0
Mason, F. F.	Swansea	1	0	0
Massey-Harris Co. (Ltd.), (C. W. Dawkins, General Manager)	54 & 55, Bunhill Row, London, E.C.	1	0	0
Masters, A.	29, St. Mary Street, Cardiff	1	1	0
Mathews, Ernest	Little Shardeloes, Amersham, Bucks	1	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Mathews, E. R. Norris, F.R.Hist. Soc.	Central Library, Bristol	1	0	0
Matthews, Adam	The Cornhill Stud, Swansea	1	0	0
Matthews, David	Llwyneryr, Morriston, Glam.	1	0	0
Matthews, L. B.	Milton, Gillingham, Dorset	1	0	0
Maule, Major-Gen. H. B.	2, Penn Lea Road, Newbridge Hill, Bath	1	0	0
Maule, M. St. John	Chapel House, Bath	1	0	0
May, A. C.	Avon House, Stoke Bishop, Bristol	1	0	0
Meade-King, W. O.	Walford House, Taunton	1	0	0
Meager, F. F.	Melbourne House, Swansea	1	0	0
Meddick, William G.	11, Great Stanhope Street, Bath	1	0	0
Medlycott, H. M.	Milborne Port, Somerset	1	0	0
Membery, R.	37, Southgate Street, Bath	1	0	0
Merriman, J. W.	126, Bryn Road, Swansea	1	0	0
Merry, Richard	Goulds, Broadclyst, Exeter	0	10	0
Merryweather, J. C.	4, Whitehall Court, London, S.W.	1	0	0
Methuen, General Lord, C.B., C.M.G.	Corsham Court, Wilts	1	0	0
Miers, R. H. P.	Clydach-on-Tawe, Glam.	1	0	0
Mildmay, Capt. C. B. St. J.	Hallam, Dulverton	1	0	0
†Mildred, G. B.	Newington House, Craven Arms, Shropshire	..		
Millbank, Sir Powlett C. J., Bart.	Norton Manor, Presteign	1	0	0
Miller, T. A., J.P.	Caisson House, Combe Hay, Bath	1	1	0
Miller, T. H.	Clan Villa, Bathwick Hill, Bath	1	0	0
Miller-Hallett, A.	Goddington, Chelsfield, Kent	1	1	0
Mills, B. W.	31, Cambridge Place, Paddington, London, W.	1	0	0
Milsom, C. and Son	9, Fleet Street, Swindon	1	1	0
Mitchell, A. C.	Highgrove, Tetbury	1	0	0
Mitchell, E. J.	The Palmer Tyre Co. (Ltd.), 119, Shaftesbury Avenue, London, W.C.	1	0	0
Molassine Co. (Ltd.)	East Greenwich, London, S.E.	1	0	0
Montefiore, Mrs.	Worth Park, Crawley, Sussex	1	1	0
Moody, C.	Maisemoor, Evercreech	1	0	0
Moore-Gwyn, J. E.	Duffryn, Neath, Glamorgan	1	0	0
†Moore, H. F.	Renée House, 48, Dulwich Road, Herne Hill, S.E.	..		
Moore-Stevens, Col. R. A.	Winscott, Torrington, Devon	1	0	0
Morant, Mrs. E.	Brokenhurst Park, Hants	1	0	0
Morel, C. E.	. . . .	1	0	0
*Moreton, Lord	Sarsden Lodge, Chipping Norton	2	2	0
*Morgan, T.	Capital and Counties Bank Buildings, Taff Street, Pontypridd	2	2	0
Morgan, W. A.	Winthankley, St. Andrew's, Fife	1	1	0

Name.	Residence.	£	s.	d.
*Morley, Earl of . .	Saltram, Plympton, Devon . .	2	0	0
Morley, Charles . . .	Shockerwick, Bath . . .	1	1	0
*Morris, C.	Highfield Hall, St. Albans . .	2	0	0
Morris and Griffin (Ltd.) .	Maindee, Newport, Mon. . .	1	1	0
Morris, Sir R. A., Bart. .	Sketty Park, Swansea . . .	1	0	0
Morris, Son and Peard .	Auctioneers, North Curry, Taunton	1	0	0
Morrison, Captain J. A. .	Berwick House, Hindon, Salisbury	1	0	0
†Morrison, J. A. . .	Basildon Park, Reading . .		..	
*Mount-Edgcumbe, Earl of .	Mount Edgcumbe, Devonport .	2	2	0
†Mucklow, E., J.P. . .	Woodhill, Bury, Lancashire . .		..	
Müller, Jansen . . .	Newport, Mon.	1	0	0
Munn, F.	Dumballs Road, Cardiff . .	1	0	0
Muntz, F. E. . . .	Umberslade, Hockley Heath, Warwickshire.	1	0	0
Muntz, J. O.	Goodameavy, Yelverton . .	1	0	0
Murray-Anderdon, H. Edwd.	Henlade House, Taunton . .	1	1	0
Naper, Col. W. D. . .	2B, Dawson Place, Hyde Park, London, W.	1	0	0
Napier, H. B. . . .	Ashton Court Estate Office, Long Ashton, Bristol . . .	1	1	0
Neagle, D. T. . . .	London, Glos. and N. Hants Dairy Company, Clifton, Bristol . .	1	0	0
Neal, J. F. . . .	Kingsdon, Taunton . . .	1	0	0
Neeld, Sir A. D., Bart., C.B.	Grittleton, Chippenham . . .	1	0	0
Nelder, C. W. . . .	Carnarvon Arms, Dulverton, Somerset	0	10	0
†Neville-Grenville, Robert .	Butleigh Court, Glastonbury .		..	
New, H. G.	Craddock, Cullompton, Devon .	1	0	0
Newington, C.	Oakover, Ticehurst, Sussex . .	1	0	0
Newman, Sir R. H. S. D. L., Bart.	Mamhead Park, near Exeter .	1	1	0
Newsham, J. C. . .	. . . .	1	0	0
Nicholetts, E. C. . .	The Lons, Bitton, Gloucestershire	1	0	0
Nichols, G.	49, Broad Street, Bristol . .	1	0	0
Nitrogen Fertilisers (Ltd.) .	Winchester House, Old Bond Street, London, E.C.	1	0	0
Nix, J.	Tilgate, Crawley, Sussex . .	1	1	0
Nixon, W.	The University, Bristol . .	1	0	0
*Normanton, Earl of . .	Somerley, Ringwood . . .	2	0	0
North, G. F. . . .	Stratfield Saye, Mortimer, R.S.O., Berks.	1	0	0
*Northumberland, Duke of	Albury Park, Guildford . .	5	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Oakey, G.	Brittleware Farm, Chariwood, Surrey	1	0	0
Oakley, H. E.	Dewstow, near Chepstow . .	1	1	0
Oborn, T.	Twinhoe Farm, Midford, Bath .	1	0	0
†O'Hagan, Lord . .	Pyrgo Park, Havering Atte Bower, Romford, Essex . . .	..		
O'Halloran, Miss P. . .	8, Upper George Street, London, W.	1	0	0
Olver, J. C. . . .	Woodland Valley, Ladock, Cornwall	1	0	0
Osborne, J. . . .	9, Clifton Park, Clifton . . .	1	1	0
Osborne, W. . . .	Barrack Farm, Odd Down, Bath .	1	0	0
Osmond and Son . .	Grimsby	1	0	0
Paget, A. B. . . .	Church Farm, Fawley, Hants .	1	0	0
Paget, L. C. . . .	Middlethorpe Hall, Yorks. . .	1	0	0
*Paget, Sir Richard, Bart. .	9, King's Bench Walk, Temple, London	2	0	0
Pain, W. H. . . .	High House, Kingsbridge . .	1	0	0
Palmer, G. Ll. . . .	Lackham, Lacock, Wilts . .	1	0	0
†Palmer, R. . . .	Lodge Farm, Nazeing, Waltham Cross, Essex	..		
Palmer, W. H. . .	York Buildings, Bridgwater . .	1	0	0
†Parker, Hon. Cecil T. .	The Grove, Corsham, Wilts . . .	..		
Parker, F. J. . . .	Plymouth Street, Swansea . .	1	0	0
Parmiter, P. J. & Co. .	Tisbury, Wilts	1	0	0
Parry-Okeden, E. . .	Turnworth, Blandford . . .	1	0	0
Parry-Okeden, Lieut.-Col. U. E. P.	Turnworth, Blandford . . .	1	0	0
†Parsons, J. D. Toogood, jun.	Manor View, Rusthall, Tunbridge Wells	..		
†Parsons, R. M. P. . .	Misterton, Crewkerne . . .	..		
Pass, A. D. . . .	Manor House, Wootton Fitzpaine, Charmouth, Dorset . . .	1	0	0
Peacock, W.	3, Buckingham Gate, London .	1	1	0
Pearce, S. & Co. . .	46a, Market Street, Manchester .	1	0	0
Pearse, T. C. . . .	Leigh Farm, Dulverton . .	1	0	0
Peel, E. Morton . .	South View, Shetty, R.S.O. . .	1	0	0
Peel, Viscount . . .	52, Grosvenor Street, London, W.	1	1	0
Pember, G. H. . . .	. . . .	1	0	0
Penberthy, Professor J. .	Dean Hall, Newnham, Glos. . .	1	0	0
Pendarves, W. Cole . .	Pendarves, Camborne, Cornwall .	1	1	0
Perkins, Col. E. K. . .	Shales, Bitterne, Hants. . .	1	1	0

Name.	Residence.	£	s.	d.
Perowne, Col. J. T. Woodrych	Conservative Club, St. James Street, London, S.W.	1	0	0
†Perry-Herrick, Mrs.	Beau Manor Park, Loughborough	..		
Petherick, R., jun.	Acland Barton, Landkey, Barnstaple	0	10	0
Petters (Ltd.)	Yeovil	1	0	0
Pettifer, T. & Co.	Eydon, Banbury	1	0	0
†Pettifer, T. Valentine, J.P., F.R.C.V.S.	The Knoll, Tetbury, Gloucester	..		
Phillips, F.	Nancoch, Newport, Mon.	1	1	0
Phillips, G.	The Gaer, Newport, Mon.	1	0	0
Phillips, J.	Messrs. J. Phillips & Co., Bath	1	0	0
Phillips, L. R.	. . . .	1	1	0
Piggott, Brothers & Co.	59, Bishopsgate Street Without, London, E. C.	1	0	0
Pike, C. A.	Chilean Nitrate Committee, Friar's House, 39-41, New Broad Street, London, E.C.	1	0	0
†Pinney, R. W. P.	Sutton Veny, Warminster	..		
†Pitt, W.	South Stoke House, Bath	..		
Plaister, C.	Church Farm, Monkton Combe, Bath	1	0	0
Plumptre, H. F.	Goodnestone, Dover	1	0	0
*Plymouth, Earl of	Hewell Grange, Bromsgrove	4	0	0
*Poltimore, Lord	Poltimore Park, Exeter	3	3	0
Poole, Mrs. A. R.	King's Hill, Dursley	1	1	0
Pope, Alfred	Dorchester	1	0	0
Pope, John	Nowers, Wellington, Somerset	1	0	0
Pope, S. P.	Howden, Tiverton, N. Devon	1	1	0
Popham, H. L.	Hunstrete House, Pensford, Bristol	1	0	0
Porter, W. J. H.	Glendale Farm, Wedmore	1	0	0
†Portman, Hon. C. B.	Goldicote, Stratford-on-Avon	..		
Portman, Hon. Mrs. C. B.	Goldicote, Stratford-on-Avon	1	0	0
*Portman, Viscount	Bryanston, Blandford	5	0	0
Price, Owen	Nantyrharn, Cray, Brecon	1	0	0
Prichard, H. L.	Penmaen, R.S.O., Glam.	1	1	0
Pritchard, D. F., J.P.	Crumlin Hall, Crumlin, Mon.	1	1	0
Proctor, H. and T. (Ltd.)	Cathay, Bristol	1	1	0
Pullen, James	Lapdown Farm, Tormarton, Gloucester	1	0	0
†Purgold, A. D.	Ebna Lodge, Gobowen, Salop	..		
Quantock Vale Cider Co.	North Petherton, Bridgwater	1	1	0
Quested, J. E.	The Firs, Cheriton, Kent	1	0	0

Name.	Residence.	Subscriptions. £ s. d.
*†Radnor, Earl of	Longford Castle, Salisbury	..
†Ransome, B. C.	Orwell Works, Ipswich	..
Ransome, E. C.	Orwell Works, Ipswich	1 0 0
Rawlence, Ernest A.	Newlands, Salisbury	1 0 0
Rawlence, G. Norman	7, Moberley Road, Salisbury	1 0 0
Read, B.	Church Farm, Cam, Dursley, Gloucester	1 0 0
Rees, D.	Brynbedw, Tylorstown, Glam.	1 1 0
Rees, W. J.	The Laurels, Swansea	1 1 0
Reeves, Robert and John, and Son	Bratton Iron Works, Westbury, Wilts	1 0 0
Remnant J. F., M.P.	The Grange, Hare Hatch, Twyford	1 0 0
Riccard, H. J. H.	5, Beaufort East, Bath	1 0 0
Rice, E. & Son	Velindre, Morriston, Glam.	1 0 0
Richardson, Rev. A.	Combe Down Vicarage, Bath	1 0 0
Riley, J. L. & A.	The Iwerne, near Ledbury	1 0 0
Robins, J.	High Bray, South Molton	0 10 0
Robins, T.	Gratton Barton, High Bray, South Molton	1 0 0
Robinson, E. S. & A. (Ltd.)	Redcliffe Street, Bristol	1 1 0
Robinson, G. & Co.	137, Fenchurch Street, London, E.C.	1 0 0
Robinson, John & Co.	Bristol	1 1 0
Roe, W. J.	West Pennard, Glastonbury	1 0 0
Rogers, E. P.	Burncoose, Perranwell, Cornwall	1 0 0
Rogerson, R. W.	Ward and Co., Northgate Street, Bath	1 0 0
Rolleston, S. V.	Saltford House, Saltford, Bristol	1 0 0
Rolleston, Col. V., J. P.	Saltford House, near Bristol	1 1 0
Rose, W. J.	Rowley Farm, Combe Hay, Bath	1 0 0
Rothschild, Lord	Tring Park, Herts	1 0 0
Rouse-Boughton, Sir W. St. A., Bart.	Downton Hall, Ludlow	1 0 0
Rouse-Boughton, Lady	Downton Hall, Ludlow	1 0 0
Rowe, F. W.	Trevego, Lostwithiel, Cornwall	1 0 0
Rowliffe, E. L.	Hall Place, Cranleigh, Guildford	1 1 0
Royal Guernsey Agricultural and Horticultural Society	Guernsey	1 0 0
Ruston, Proctor & Co. (Ltd.)	Lincoln	1 0 0
Rutherford, J. A.	Highclere Estate Office, Newbury, Berks	1 0 0

Name.	Residence.	Subscriptions. £	s.	d.
Sage, J.	Vale Farm, Batcombe, Evercreech	1	0	0
Saillard, P.	Buchan Hill, Crawley, Sussex	1	0	0
St. Audries, Lord	St. Audries, Bridgwater	1	1	0
*St. Germans, Earl of	St. Germans, Cornwall	2	0	0
†Salmon, H. C.	North Field, Bridgwater	..		
Salomons, L.	Norbury Park, Dorking, Surrey	1	0	0
Salter, Benjamin	Newlands, Broadclyst, Exeter	1	0	0
Salter, T.	Beare Farm, Broadclyst, Exeter	1	0	0
Samuel, A.	74, Mansel Terrace, Swansea	1	0	0
Samuelson, Ernest	Bodicote Grange, Banbury	1	1	0
Sanders, R. A., M.P.	Barwick House, Yeovil	1	0	0
Sandys, Capt. G. J., M.P.	Hatherleigh House, Weston-super-Mare	1	1	0
Sanford, Col. E. C. A., C.M.G.	Highover, Westerham, Kent	1	0	0
Sanford, H. S. J. A.	The Court House, Middlehill, Broadway, Worcestershire	1	0	0
Sankey, R. I.	Queen Anne Mansions, St. James's Park, London, S.W.	1	0	0
Scobell, Col. Barton L. J.	Kingwell Hall, High Littleton, near Bristol	1	1	0
†Scott, T.	Ditton Court, Maidstone	..		
†Seaton, Lord	Beechwood, Plympton, Devon	..		
Sedgwick, T. E.	26, Oriental Street, Poplar, London, E.	1	1	0
Senior and Godwin	Auctioneers, Sturminster Newton, Dorset	1	1	0
Shackell, R. F.	Church Farm, Twerton-on-Avon, Bath	1	0	0
Shakerley, Col. H. W.	Enham Place, Andover	1	0	0
†Shaw-Stewart, Walter R.	Hayes, Shaftesbury	..		
Shatford, F.	Bosmore Farm, Henley-on-Thames	1	0	0
Sheldon, W.	Long Lane Farm, Bexley Heath	1	0	0
*Shelley, Sir John, Bart.	Shobrooke Park, Crediton	2	2	0
Shelley, J. F.	Posbury House, near Crediton	1	0	0
Sheppard, P. C. O.	Bridgend, Glam.	1	1	0
Sheppard, W. A.	14, Widcombe Crescent, Bath	1	0	0
†Sherston, Major C. D.	Evercreech, Somerset	..		
†Sherston, C. J. T.	Harewood, Leeds	..		
*Sidmouth, Viscount	Upottery Manor, Honiton	2	0	0
Sillifant, A. O.	Culm Leigh, Stoke Canon, Exeter	1	0	0
Simonds, L. de L.	Audley's Wood, Basingstoke	1	1	0
*Simpson, Charles (Hewthorn & Co.)	Walton Lodge, Broxbourne, Herts	2	0	0
Simpson, F. C.	Maypool, Churston Ferrers, R.S.O., S. Devon	1	0	0
Sinclair, James	8, Breams Buildings, Chancery Lane, London, E.C.	1	0	0
*Singer, W. M. G.	42, Charles Street, Berkeley Square, London, W.	2	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Skinner, G. C.	Pound, Bishops Lydeard	1	0	0
Skyrme, J. H.	Madley, Hereford	1	0	0
Slatter, J.	Paxford, Campden, S.O., Glos.	1	0	0
Smail, J. I.	Warren Wood, Hayes, Kent	1	1	0
Smart, G. E.	Combe Hay Manor, Bath	1	1	0
Smith, A. J.	Brooklea, St. Anne's Park, Bristol	1	0	0
Smith, C. C. F.	Perfect Dairy Machines (Ltd.), 105, Middle Abbey Street, Dublin	1	0	0
Smith, Bros. & Co. (Ltd.)	Westgate Buildings, Bath	1	0	0
Smith, J.	Monkton,Hereford	1	0	0
†Smith, J. W.	Thinghill Court, Hereford	..		
Smith, Hon. Mrs. Murray	Gumley Hall, Market Harborough	1	0	0
†Smith, S. Lee	Larkfield, Maidstone	..		
Smith-Barry, J. H.	Stowell Park, Pewsey, Wilts.	1	0	0
Smyth, P.	Broford, Dulverton	1	0	0
Smyth-Richards, G. C.	Filleigh Lodge, South Molton	1	0	0
Snow, Major A. D.	Wall Tyning, Bitton, Nr. Bristol	1	1	0
*Somerset, Duke of	Maiden Bradley, Bath	2	0	0
Somerset Trading Co. (Ltd.)	Bridgwater	1	1	0
†Somerville, A. F.	Dinder House, Wells, Somerset	..		
South-Eastern Agricultural College (The Principal)	Wye, Kent	1	0	0
Southwood, J. W.	1, St. Peter's Terrace, Twerton, Bath	1	0	0
Spear Brothers and Clark (Ltd.)	Southgate Street, Bath	1	0	0
†Spearman, Sir J. L. E., Bart.	. . . .	..		
Spencer, F.	Pondsmead, Oakhill, Bath	1	1	0
Spencer, W. C.	Manor Farm, Hillfield, Cattistock, Dorset	1	0	0
Spicer, Capt.	Spye Park, Chippenham	1	0	0
Spicer, Lady M.	Spye Park, Chippenham	1	0	0
*Spillers & Bakers (Ltd.)	Cardiff	2	0	0
Spratts' Patent (Ltd.)	24 and 25, Fenchurch Street, City, London, E.C.	1	0	0
*†Stanley, E. A. V.	. . . .	..		
Stephens, H. C.	Avenue House, Finchley, N.	1	0	0
Stevens, R. N.	Woodham Hall, Woking, Surrey	1	0	0
Stephenson, R. E. W.	Tue Brook, Liverpool	1	0	0
Steward, Major R. H.	Freshford, near Bath	1	0	0
Stewart, Rev. H. J.	The Vicarage, Cockett, Glam.	1	0	0
Stilgoe H. W.	The Grounds, Adderbury, near Banbury, Oxon	1	0	0
Stoddart, F.	Manor House, Walton, Clevedon	1	1	0
Stoffell, W. M.	11, Cavendish Place, Bath	1	1	0
Stokes, C. W. Rees	Town Clerk, Tenby	1	1	0

Name.	Residence.	£	s.	d.
Stooke, J.	Sherford, Brixton, Plymouth	1	0	0
Storrar, J.	Grittleton, Chippenham	1	0	0
Stothert, P. K.	Bradford-on-Avon, Wilts	1	0	0
†Strachie, Lord	Sutton Court, Pensford, Somerset	..		
Strangways, Hon. H. B. T.	Shapwick, Bridgwater	1	0	0
Stratton, Richard	The Duffryn, Newport, Mon.	1	0	0
Stride, T.	Southgate Street, Bath	1	0	0
Strode, G. S. S.	Newnham Park, Plympton	1	0	0
*Stuart, Lord Ninian Crichton, M.P.	Cardiff	2	2	0
Stucley, H. V. G.	Pillhead, Bideford, North Devon	1	0	0
Studdy, T. E.	Mazonet, Stoke Gabriel, Totnes	1	0	0
Studley, J. Im.	Toller Fratrum, Maiden Newton	1	0	0
*Sutton, E. P. F.	Sidmouth Grange, near Reading	2	2	0
*Sutton and Sons	Seedsmen, Reading	2	2	0
Swansea, Lord	Singleton, Swansea	1	1	0
Swanwick, Bruce	R. A. College Farm, Cirencester	1	0	0
Swanwick, R.	College Farm, Cirencester	1	0	0
Sweet, E. M.	31, Queen Street, Cardiff	1	0	0
Symons, J. & Co. (Ltd.)	The Plains, Totnes	1	1	0
Talbot, Miss	Margam Park, Port Talbot	1	0	0
Tamlin, W.	Talbot House, Stanley Road, Teddington, Middlesex	1	0	0
Tangyes (Limited)	Cornwall Works, Birmingham	1	0	0
Tanner, H.	Westgate Buildings, Bath	1	0	0
Tapp, David James	Knaplock, Winsford, Dulverton	1	0	0
Tapp, J. A.	Knaplock, Dulverton	1	0	0
Tasker W. & Sons (Ltd.),	Waterloo Ironworks, Andover	1	1	0
Tate, J. A.	Fairfield, Wells, Somerset	1	0	0
Tatem, W. J.	The Court, St. Fagan's, Glam.	1	0	0
Taverner, G. E.	Budlake, Devon	1	0	0
Taylor, A. H. W.	8, New Bond Street, Bath	1	0	0
†Taylor, George	Cranford, Hounslow, W.	..		
Taylor, H. W.	Showle Court, Ledbury, Hereford	1	0	0
†Tazewell, W. H.	Manor House, Taunton	..		
*Temple, Earl	Newton St. Loe, Bristol	2	2	0
Templeman, G. D.	Hambridge, Curry Rivell, Taunton	1	0	0
Thomas, D. A., M.P.	Llanwern, Newport, Mon.	1	1	0
Thomas, E. E.	13, Bramham Gardens, London, S.W.	1	0	0
Thomas, Sir Griffith	Court Herbert, Neath	1	0	0
Thomas, I.	Ely Farm, Cardiff	1	0	0
Thomas, J.	Velindre, Kidwelly, Carmarthenshire	1	0	0
Thomas, J. A.	Dolgoy, West Cross, R.S.O., Glam.	1	0	0
Thomas-Stanford, C.	Preston Manor, Brighton	1	0	0

Name.	Residence.	£	s.	d.
Thomas, W. Jones	Dros-y-Mor Park Road, Barry, Glam.	1	1	0
Thomas, W. Meyler	Ynysplwm, Llantrissant	1	0	0
Thomas & Evans & John Dyer (Ltd.)	Swansea	1	0	0
Thompson, C. E.	Camerton, Bath	1	1	0
Thompson, J. W. H.	2, Southwick Crescent, London, W.	1	1	0
Thorley, J.	Wood Hall, Shenley, Herts	1	0	0
Thorne, J. G.	Horridge, Romansleigh, S. Molton.	0	10	0
Thornton, W. A.	Lock, Partridge Green, Sussex	1	0	0
Thresher, E. B.	Corfe Hill, Weymouth	1	0	0
Thring, D. T.	1, Sheep Street, Northampton	1	1	0
Thurlow, G. R.	Stowmarket	1	0	0
*Thynne, Lord A., M.P.	15, Manchester Square, London	2	0	0
Tidswell, R. J.	Haresfield Court, Stonehouse, Glos.	1	0	0
Tillard, Rear-Admiral P. F.	Alford House, Castle Cary	1	0	0
Tilley, R.	Chippenham	1	0	0
Tilley, W. T. S.	East Compton, Shepton Mallet	1	1	0
Timmins, T. B.	24, Green Park, Bath	1	0	0
Tipper, B. C., and Son	Balsall Heath, Birmingham	1	0	0
Titt, J. W.	Implement Works, Warminster	1	0	0
Toogood, E. K.	Messrs. Toogood & Sons, Southampton	1	0	0
Tory, Randolph	Charisworth, Blandford	1	0	0
Trafford, G. R.	Hill Court, Ross, Herefordshire	1	1	0
*Tredegar, Viscount	Tredegar Park, Newport, Mon.	2	2	0
Treffry, I. de C.	Penarwyn, Par Station	1	1	0
Trefusis, Col. The Hon. J. L.	Hawkmoor, Bovey Tracy, Devon	1	0	0
Trelawney, J. S.	Harewood, Buckfastleigh, Devon	1	0	0
†Tremaine, W. H.	Sherborne, Northleach, Glos.		..	
Tremayne, Capt. W. F.	Carclews, Perran ar Worthal, Truro	1	1	0
Tremayne, Hon. Mrs.	Sydenham, Lewdown, R.S.O., N. Devon	1	0	0
Trevilian, E. B. Cely	Midelney Place, Curry Rivell, Taunton	1	0	0
Troup, Alan C.	Doddean, Salisbury	1	0	0
Troyte, H.	Huntsham Court, Bampton, Devon	1	0	0
Troyte, H. A.	Slindon, Arundel, Sussex	1	0	0
Trump, W.	Borough Farm, Broadclyst, Exeter	1	0	0
Tucker, H.	Sutton Montis, Sparkford, Bath	1	0	0
Tucker, M. & Co.	Broad Quay, Bath	1	0	0
†Tudway, C. C.	The Cedars, Wells, Somerset		..	
Turner, J. H.	West Molland, South Molton	1	0	0
Turner Brothers	Milsom Street, Bath	1	0	0
Turnor, Lt.-Col. W. W.	Pinkney Park, Chippenham	1	0	0
Twentyman, Exors. of the late A. C.	Castlecroft, Wolverhampton.	1	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Unite, John (Ltd.)	291, Edgware Road, London	1	1	0
Unwin, L.	Tiverton	1	0	0
†Vacher, E. P.	Cowfold Lodge, Cowfold, Sussex		..	
Valletort, Viscount	Mount Edgcumbe, Devonport	1	1	0
Vaughan, Rev. Preb.	The Rectory, Wraxall, Somerset	1	0	0
Vaughan, W. I.	9, Queen's Place, Cardiff	1	0	0
Veitch, P.	Exeter	1	0	0
†Verulam, Earl of	Gorhambury, St. Albans		..	
Vicary, W.	The Knoll, Newton Abbot, S. Devon	1	0	0
Vine & Co. (Ltd.)	Cornhill Chambers, Swansea	1	0	0
Vivian, Mrs. C. C.	Forest Hall, Cockett, Glam.	1	0	0
Vivian, C. C.	Forest Hall, Forest Fach, Glam.	1	0	0
Vivian, Miss	Clyne, Blackpyl, S. Wales	1	1	0
Vivian, Hon. Odo	Sketty, Swansea	1	0	0
Waide, W. and Sons	Churn Works, Leeds	1	0	0
Waldegrave, Earl	Chewton Priory, Somerset	1	0	0
*Waleran, Lord	44, Hans Mansions, London, S.W.	2	0	0
Walker, E. G. F.	The Hollies, Chew Stoke, Bristol	0	10	0
Walker, H.	Beach, Bitton, Glos.	1	0	0
Wallis and Stevens	North Hants Iron Works, Basingstoke	1	0	0
Wallop, Hon. J.	Barton House, Morchard Bishop, Devon	1	0	0
Walrond, Hon. L., M.P.	Bradfield, Cullompton	1	1	0
†Walsingham, Lord	Merton Hall, Thetford, Norfolk		..	
Ward, J. E.	Red Lodge, Purton, Wilts	1	0	0
Ward, R. B.	Westwood Park, Droitwich	1	0	0
Wardlaw, H. and A.	Holway Farm, Sherborne	1	0	0
†Waring, C. E.	Conservative Club, Cardiff		..	
Waring, H. F.	Farningham Hill, Farningham, Kent	1	0	0
Warne, J.	Treveglos, St. Mabyn, R.S.O.	1	0	0
Warne, T.	Trevisquite Manor, St. Mabyn, R.S.O.	1	0	0
†Warner, T. C.	Bretterham Park, Suffolk		..	
Waterloo Mills Cake and Warehousing Co. (Ltd.)	Wilmington, Hull	1	0	0
Watkins, H. R.	Cynghordy, Langland, near Swansea	1	0	0
Watson, H. R.	Purse Caundle, Sherborne	1	0	0
Watson, T. E.	St. Mary's Lodge, Newport, Mon.	1	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Watts, J.	Backwell, near Bristol	1	0	0
*Way, General N. S.	Manor House, Henbury, Bristol	2	0	0
Weaver & Co.	Beaufort Warehouses, Swansea	1	0	0
Webb, E. and Sons	Wordsley, Stourbridge	1	0	0
Webb, H., M.P.	Llwynarthen, Cardiff	1	0	0
Weech, J. and Sons	Maudlin Street, Bristol	1	0	0
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17				
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END OF VOL. IX.

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HORSES.

Brydon, Robert, Seaham Harbour, County Durham. Breeder of Pedigree Clydesdale Horses. Chief Stud Horses: Silver Cup (11184) and Bonnie Buchlyvie (14032), both of which have been first-prize winners at the Royal and Highland Shows. Bonnie Buchlyvie was also Cawdor Cup winner in 1909. Colts and Fillies on sale. Foreign orders carefully attended to. Inspection invited. Telegrams and station: Seaham Harbour.

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HORSES—*continued.*

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HORSES—*continued.*

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CATTLE—*continued.*

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